Thunder Bay utilizes Modern Methods

HERE you see the press section of the BELOIT Removable High Speed News Machine at the new Thunder Bay mill in Port Arthur, Ontario, Canada. This modern machine is equipped with the BELOIT patented Suction Couch Roll and BELOIT Suction Press Roll. It is designed to operate smoothly at 1200 feet of paper speed per minute. It is equipped with Timken bearings throughout.

New mills are quick to grasp modern methods, knowing that their operating costs will be greatly lowered. Speeding up production with the modern BELOIT Removable Fourdrinier has enabled many a mill to operate more profitably.

It will pay you to investigate the advantages of the "BELOIT."

The removable way is the modern way

BELOIT IRON WORKS, BELOIT, WIS., U. S. A.

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Cutters
Cylinder Machines
Drives for Paper Machines
Winders and Slitters
Removable Fourdriniers
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Yankee Machines
Rebuilding & Repairs

The BELOIT

BELOIT IRON WORKS PAPER MACHY BELOIT WIS.

MEMBER OF A. B. C. AND A. B. P.

Vol. 9.—No. 12

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry
THOMAS J. KEENAN, Associate Editor, 18 East 41st Street, New York City

CONTENTS

FOR MARCH, 1928

Editorials		1983-1984-1986
Technical Control in the Pulp and Paper Industry	*Ernst Mahler*	2039
Lessons in Paper Making—Lesson XIX	*Harry Williamson*	2043
Current Thought	*William Sibley*	2046
Direct Contact with the Worker	*Herbert D. Allen*	2049
Safety Contest Scores		2053
Power Requirements for Pumping Paper Stock	*Russell K. Annis*	2054
Beating with Rods	*Sydney D. Wells*	2054d
Practical Helps for the Mill Man		2054g
Fifty-First Annual Convention of the American Paper and Pulp Association		2055
Report of the Executive Secretary—1927-1928		2056
Technical Association Holds Annual Meeting		2087
Salesmen's Association Meeting		2107
Woodlands Section Meeting		2109
Cost Association Holds Meeting		2111
Paper Merchants Meet and Elect		2113
The Wonders of Modern Paper Mills		2119
Canadian Section		2133
The Month at Washington		2141
Commercial Forestry	*F. J. Sensenbrenner*	2167
Opportunity Section		2182
Technical Developments in the Paper Industry		2187
Commercial Outlook		2195
Domestic Raw Materials		2197
Current Quotations		2203
Import and Export Markets		2205
Buyers' Guide		2215-2219
Advertisers' Index		2221

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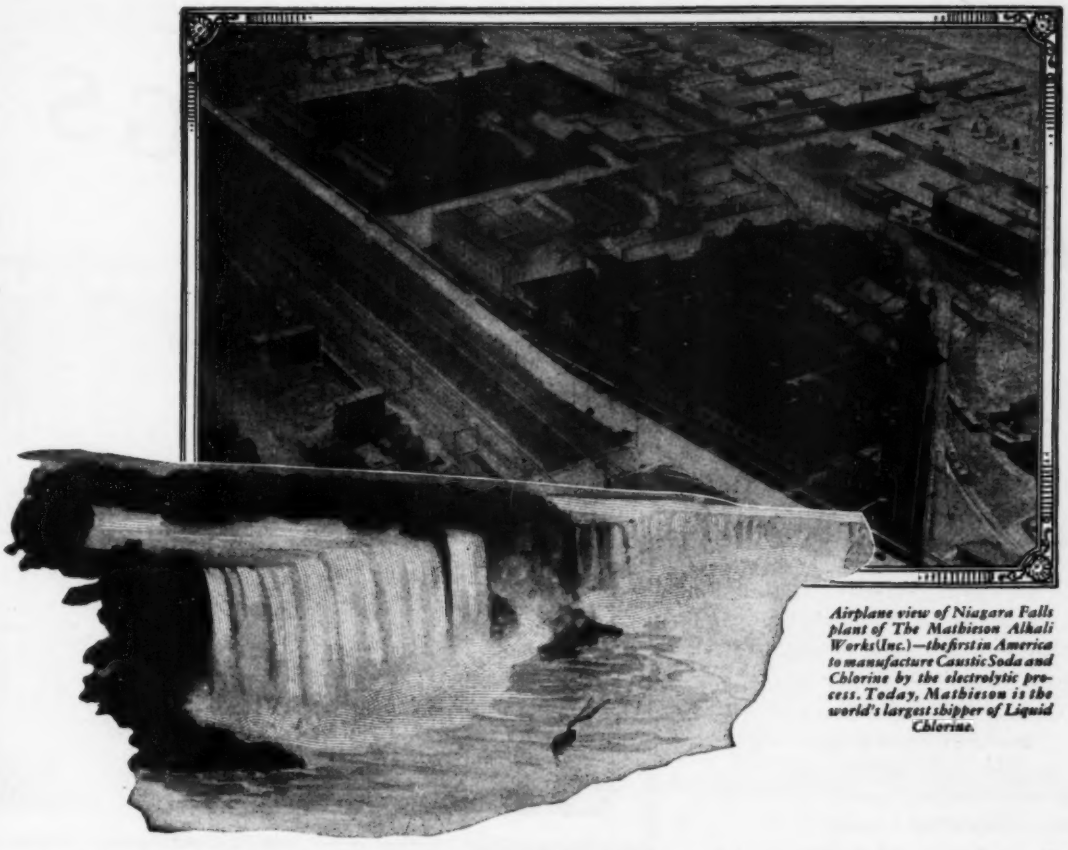

Airplane view of Niagara Falls plant of The Mathieson Alkali Works (Inc.)—the first in America to manufacture Caustic Soda and Chlorine by the electrolytic process. Today, Mathieson is the world's largest shipper of Liquid Chlorine.

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FROM the raging torrents of the world's most famous waterfall, the Mathieson plant at Niagara draws the thousands of horsepower used in the production of Niagara Caustic Soda, Liquid Chlorine, Bleaching Powder and Synthetic Ammonia.

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No matter what your chemical requirements may be—no matter when and where you may desire delivery, the adequately equipped Mathieson organization stands ready to prove to you the quality and uniformity of EAGLE-THISTLE products, and the smooth-running, dependable promptness of Mathieson service.

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Among the Large Users of Alberene Furnace Linings Are:—

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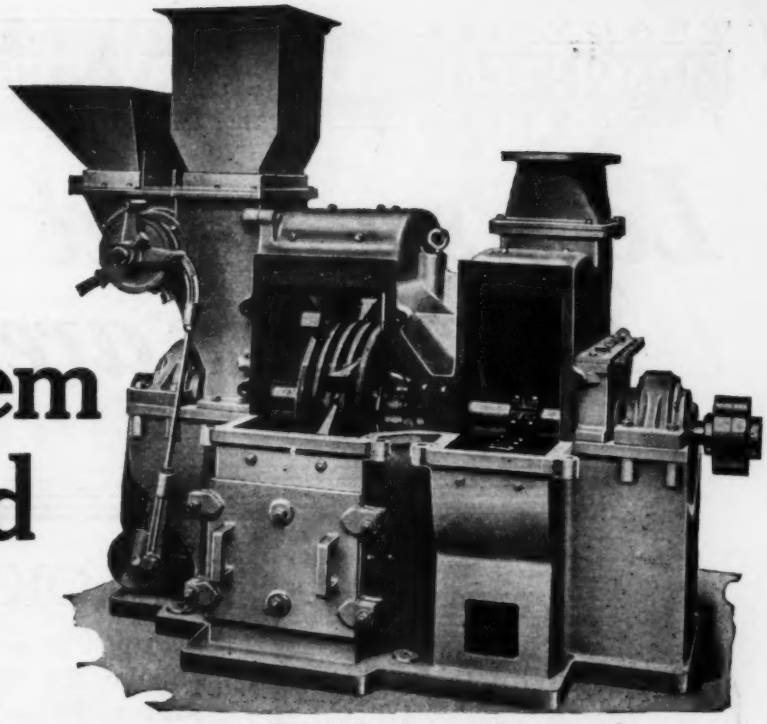
Lopulco Unit System Pulverized Fuel



Lopulco Unit Mill with cover plate removed, showing ease of access to operating parts.

A Pulverized Fuel *System,* to be successful must be exactly what the term implies —

an orderly combination and arrangement of component parts functioning as a complete unit.

A good mill, although an important detail, is not sufficient, pulverization is only the first step in pulverized coal firing. Burner design is important. Furnace design is important. But, the factor *most* essential to successful pulverized fuel burning is the correct grouping of all the individual elements, into one complete, properly balanced, application.

The wealth of experience incident to the design and application of Lopulco Storage Systems to hundreds of boilers forms an excellent background for the Lopulco Unit System of direct firing.

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TRACYFIER TRACYFIER
ABSOLUTELY - CLEAN, DRY STEAM - GUARANTEED
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Let's see what Tracyfiers are doing -

in OKLAHOMA

A battery of seven boilers at The Empire Refining Co. discharged dirt and water removed by the Tracyfiers into a concrete trough one foot square. The sludge was so thick that every hour *a man had to throw sludge out of the trough to keep it from overflowing.* This clearly visualizes the dirt that is removed by the Tracyfier.

TRACYFIERS SAVE MONEY BY

Keeping Turbines Clean
Keeping Safety Devices Clean
Preventing Turbine Blade Erosion
Saving Cost of Reblading
Preventing Scored Valves
Maintaining Engine Economy
Stopping Slugs of Water
Saving Cylinder Oil
Increasing Superheat
Keeping Superheaters Clean
Keeping Steam Lines Clean
Preventing "White Deposits"

JUST imagine the conditions in this plant before Tracyfiers were installed, practically pumping mud through the lines—grinding away valves, regulators, pipes, turbine blades and other steam-using equipment.

The solution to the dirty steam problem is *complete* purification with Tracyfiers. Nothing less than 100% clean—100% dry steam will do. Let us tell you the complete Tracyfier story and show you how Tracyfiers play a most vital part in pure steam production.

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DIVISION OF
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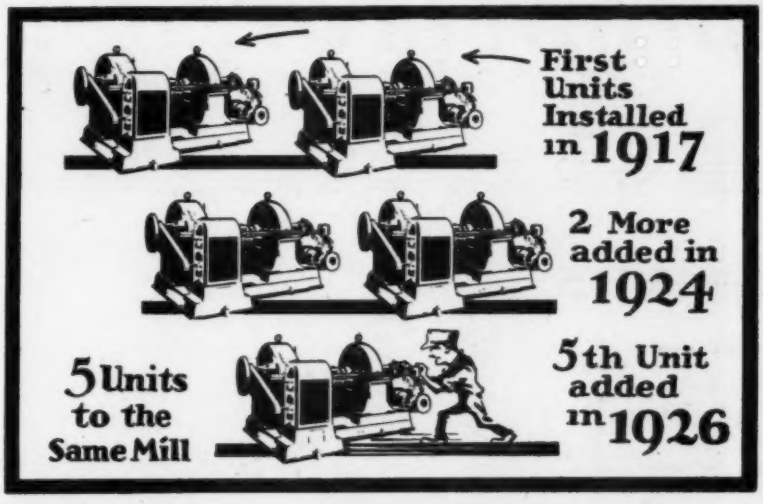
TRACYFIER
THE STEAM PURIFIER

The TERRY Paper Machine Drive

[Variable or Constant Speed]



Repeat Orders Indicate *Satisfaction*

The proof of the pudding is in the eating!

The backbone of our business comes from satisfied users.

Write for details on Terry Paper Machine Drive.

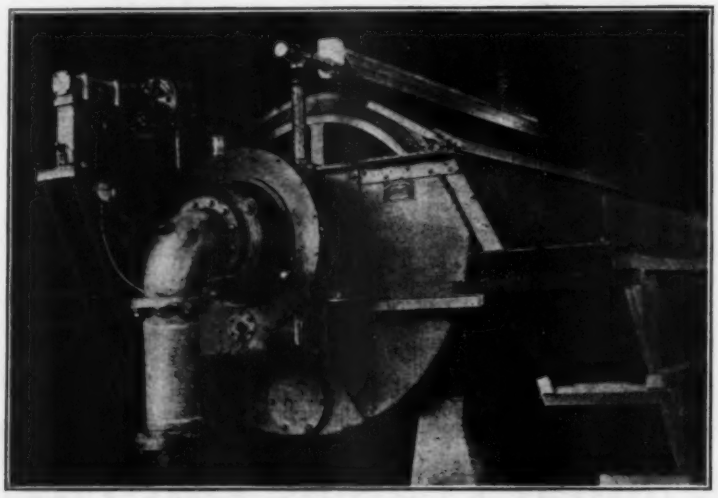
T-1009

The Terry Steam Turbine Company

TERRY SQUARE, HARTFORD, CT.
OFFICES IN PRINCIPAL CITIES
Steam Turbines + Gears + Shaft Couplings

NINETEEN OLIVERS

in repeat orders from paper mills in one month, can only be explained by the satisfactory performance of machines already in use.



Oliver-Save-All in an Oregon Mill

Paper Olivers

are doing good work wherever installed and are *saving* and *making* money for their owners. Recent Olivers do even better work owing to improvements in construction and operation.

Olivers
do not stand still

Washers, Lime Mud and Bleach; Thickeners; Deckers, Pulp and Ground Wood; Save-Alls.

See page 378 in the 1927 Paper and Pulp Mill Catalogue.

Oliver Continuous Filter Co.

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E. L. Bateman, Locarno House

London
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Honolulu, T. H.
W. A. Ramsay, Ltd.

NAYLOR **SPIRALWELD** Toncan Iron Pipe for paper mills is now made of Toncan Iron, the most durable material of commercial price that can be used for the purpose, being far more resistant to rust and corrosion, and enabling us to offer the greatest pipe values obtainable at prices paralleling those of ordinary pipe.

Naylor **SPIRALWELD** Toncan Iron Pipe, made of Toncan Iron, provides light weight to assure low first, shipping, handling and installing costs. The scientific combination of pure iron, copper and mo-lyb-den-um resists rust and corrosion, which so quickly destroy pipe of other materials.

Naylor **SPIRALWELD** Toncan Iron Pipe is made on a lathe turned arbor to assure an absolutely smooth inside and true diameter, which provide a lower frictional resistance than any other pipe, and reduce to a minimum capillary attraction and clogging, due to slime.

It is made to wrought pipe standards with threaded or flanged ends for standard pipe fittings—and grooved ends for Bolted and Victaulic Couplings.

For paper mill men who are interested in more permanent pipe lines, a study of Naylor **SPIRALWELD** Toncan Iron Pipe values will reveal many reasons for its superiority. To facilitate such a study by you, we are prepared to forward a sample section on request.

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Naylor Spiral Pipe Company

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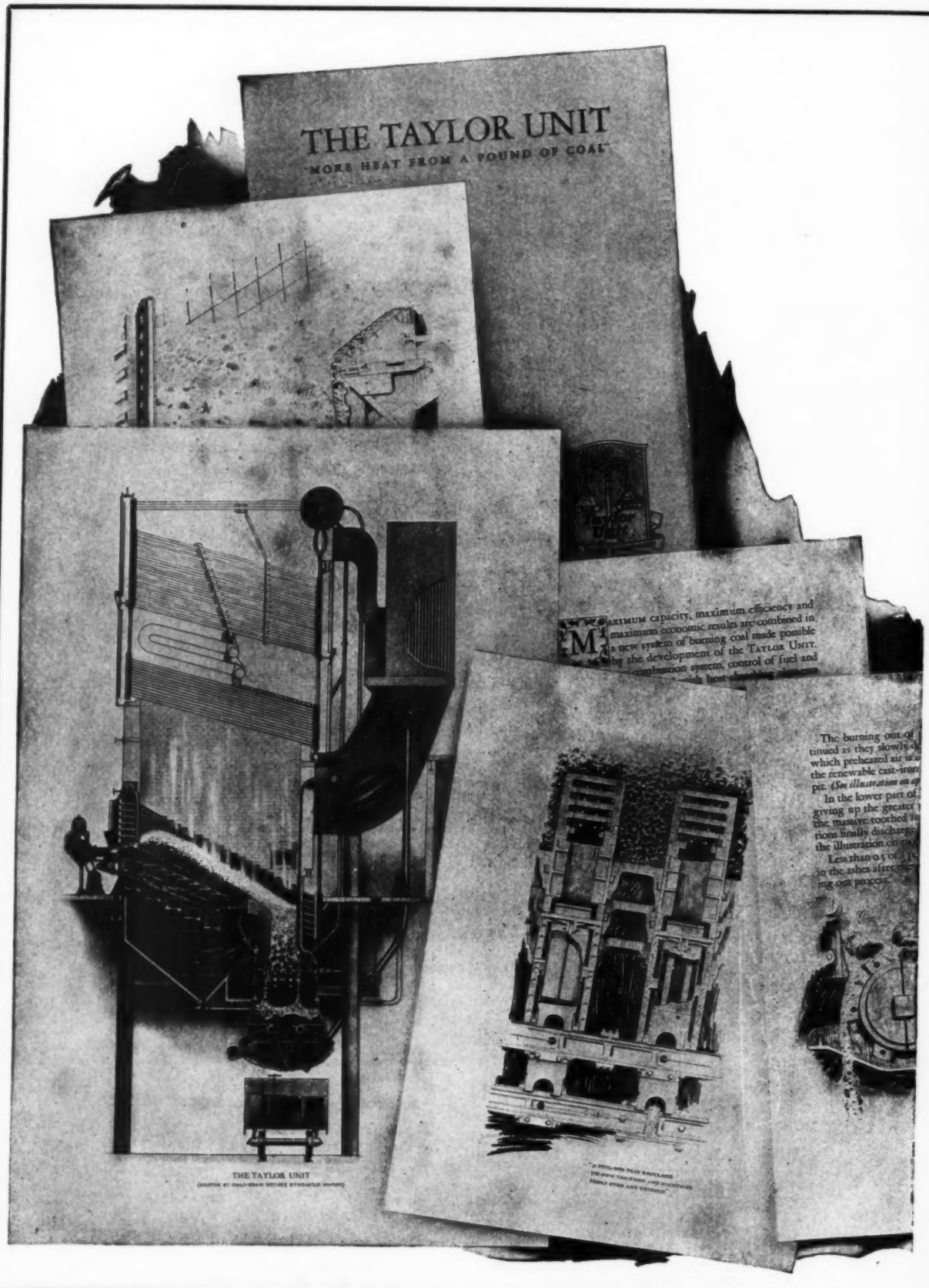
1242 East 92nd Street, Chicago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THE TAYLOR UNIT

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and

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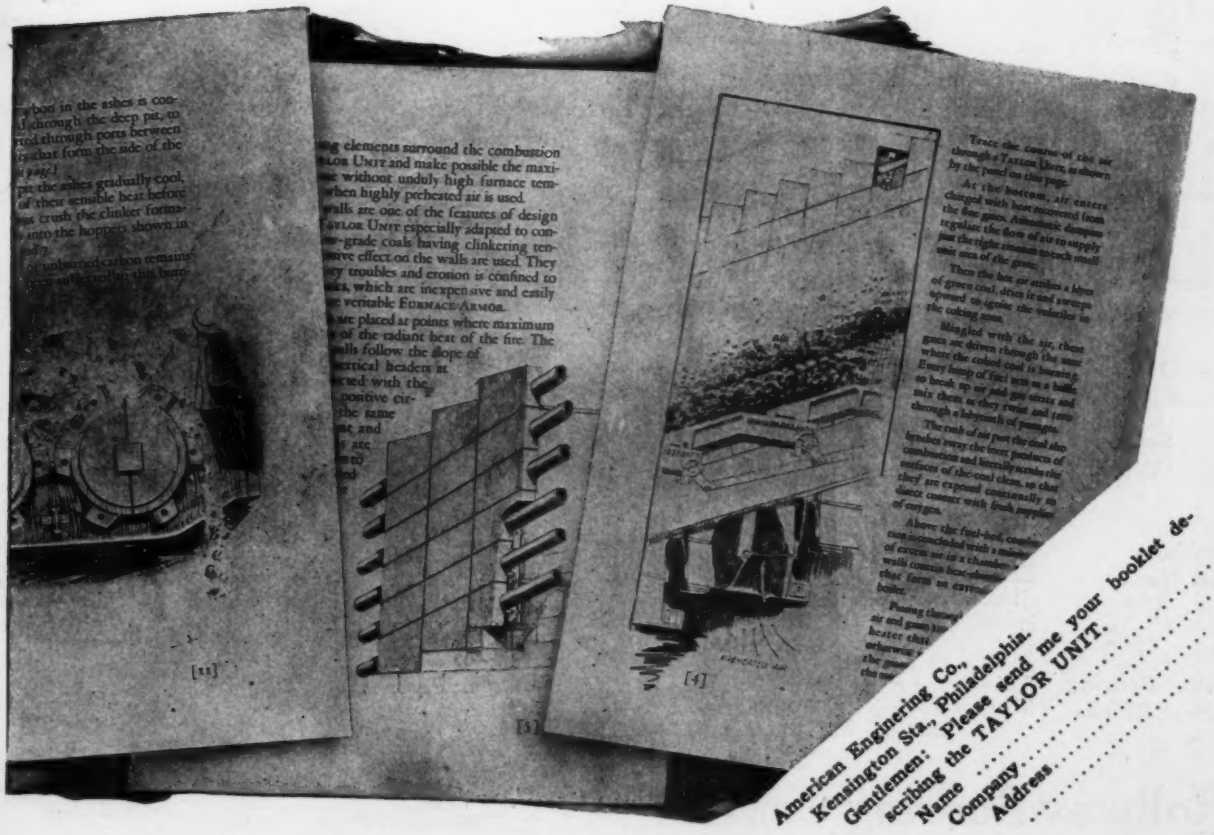
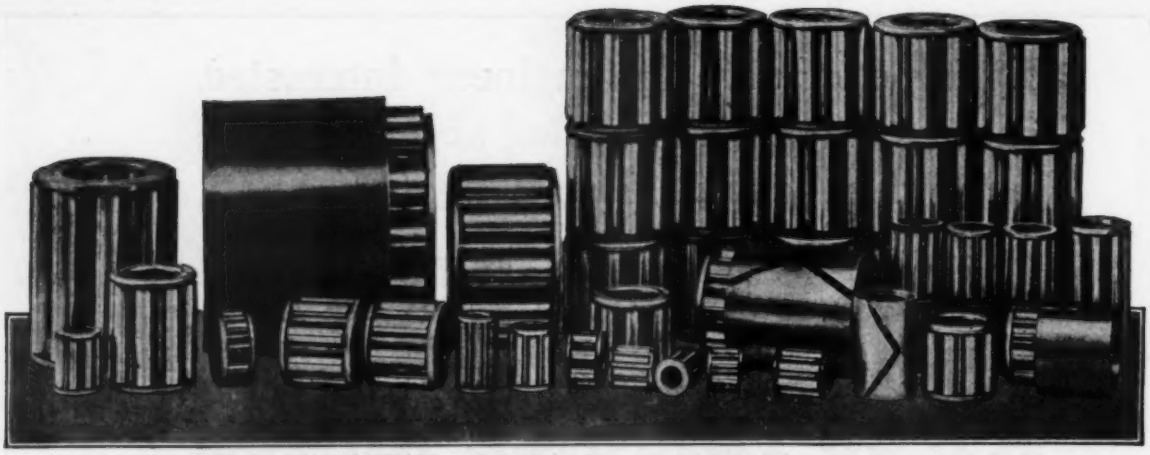


American Engineering Co.,
Kensington Sta., Philadelphia.
Gentlemen: Please send me your booklet describing the TAYLOR UNIT.
Name .....
Company .....
Address .....



Typical Group of Rollway Wide Series and Utility Bearings

ROLLWAY CYLINDRICAL ROLLER BEARINGS

for Heavy Industrial Service

For more than 18 years the Rollway organization has specialized in the design, manufacture and application of Cylindrical Roller Bearings to railway and heavy industrial service. The principal classes of bearings which we are now making are listed below:

Maximum Type Radial Bearings — Sixteen types of Heavy-Duty Precision Bearings in sizes interchangeable with annular ball bearings or with metric sizes of roller bearings. ***Catalog 3-A***

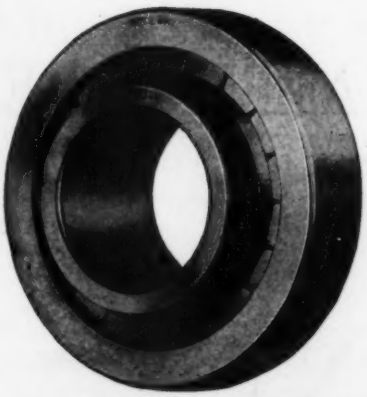
Roller Thrust Bearings — Six types of Heavy-Duty Bearings, single-acting and double-acting, with and without aligning washers. ***Catalog 3-A***

Crane Hook Thrust Bearings — Large capacity long life hook bearings permit loads to swivel freely under heaviest loads. ***Bulletin No. 51***

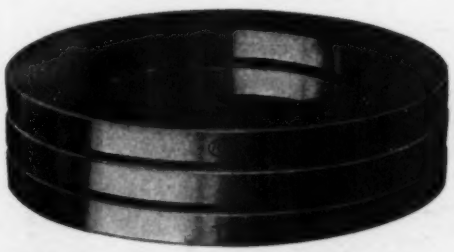
Wide Series and Utility Types — Seven types, with various combinations of inner and outer sleeves. Five of these types designed for rollers operating directly on shaft. ***Catalog 4-A***

Bearings Roll Neck — Large Heavy Duty Bearings for Calender or Super Calender Rolls, oil mill crushing rolls and main rolls in steel or brass rolling mills. ***Bulletin No. 52***

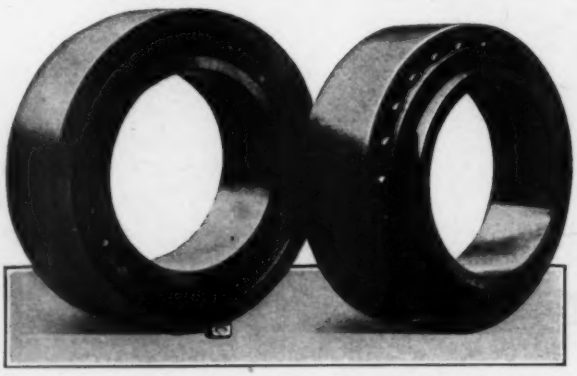
Roller Bearing Pillow Blocks — Self-aligning pillow blocks for shafting from $1\frac{3}{16}$" to $9\frac{7}{8}$" diameter. ***Bulletins No. 53 and No. 55***



Maximum Double Width Bearing, Full Roller Type, with Wide Inner Race to Give Ample Seat on Shaft



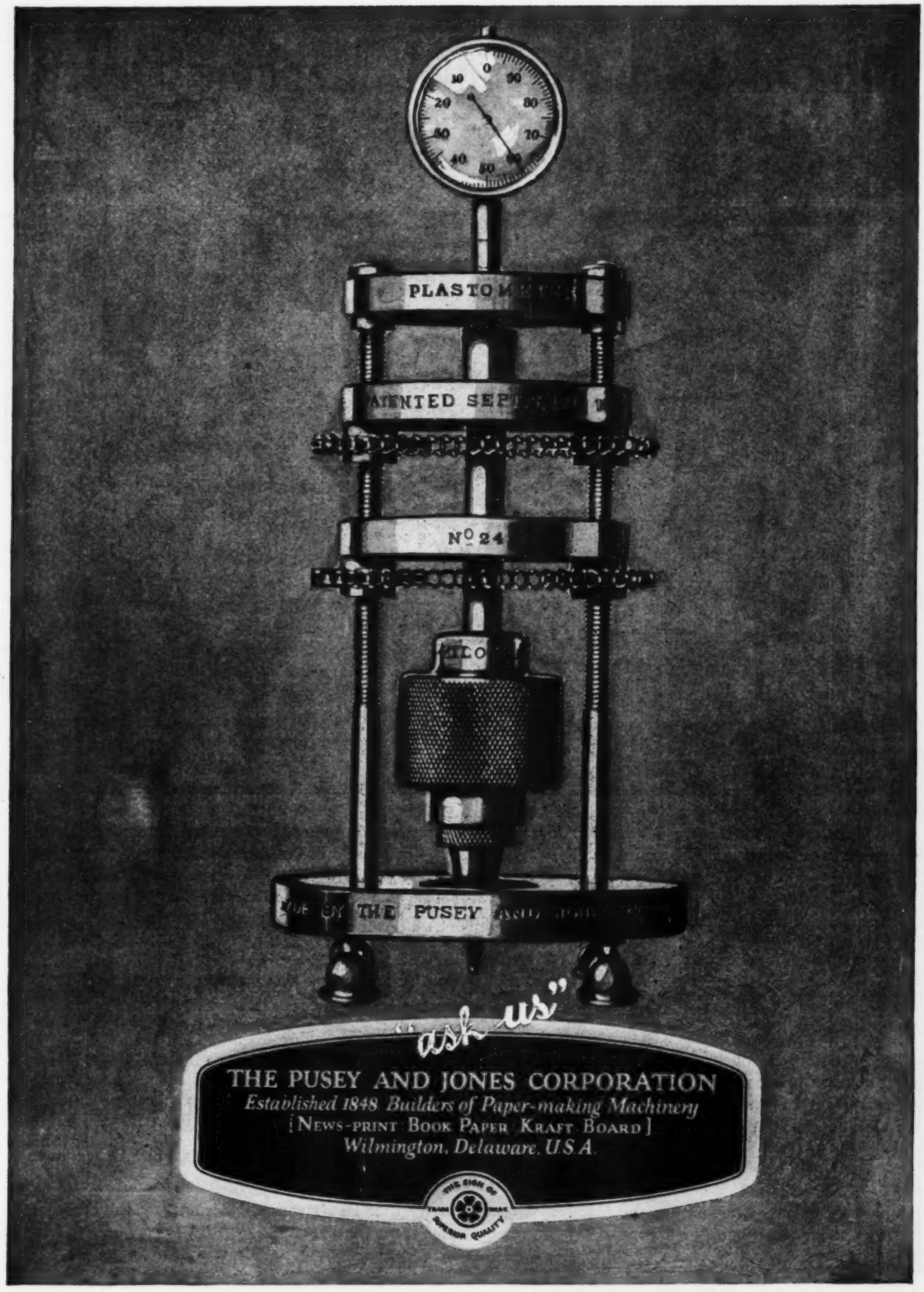
Single Acting, Flat Washer Type Roller Thrust Bearing



Rollway Bearing for Roll Neck—Estimated Capacity One Million Pounds

Rollway Bearing Co., Inc.

Syracuse New York

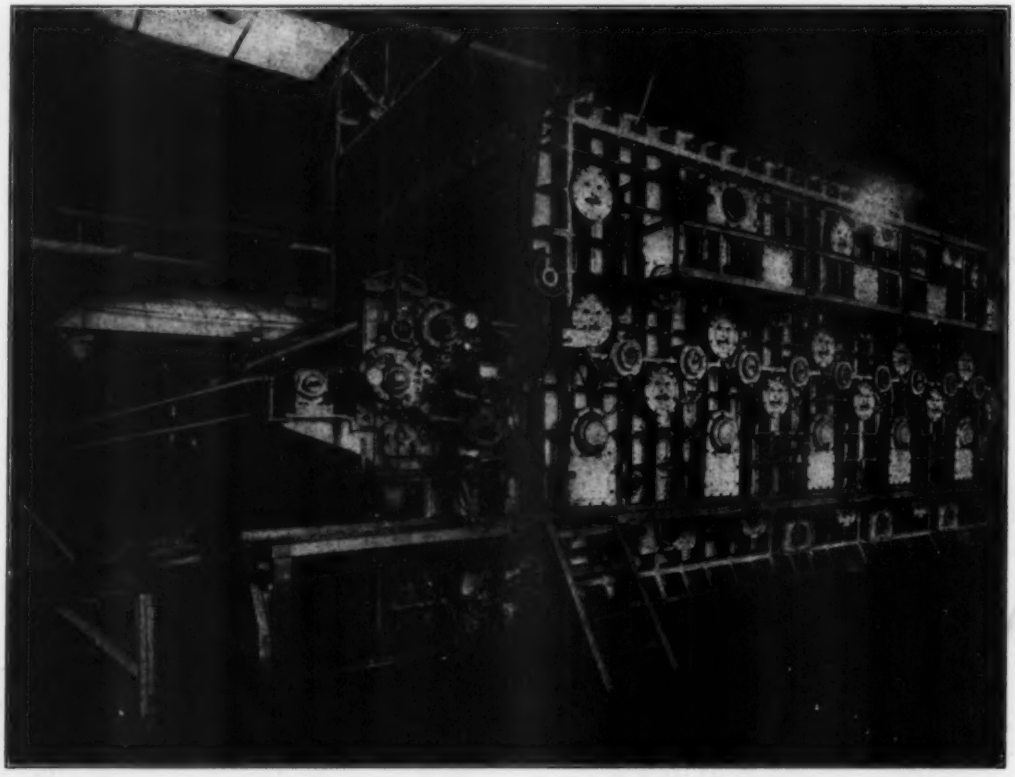


The Plastometer—an exclusive Puseyjones product—the accepted standard for measuring the density or hardness of mechanical rubber, such as those for covering press rolls.

Copyrighted 1927 by The Pusey and Jones Corporation, Wilmington, Delaware, U. S. A.

Minton Vacuum Paper Machine Dryer

A New and improved method of drying paper of ALL KINDS in which paper is dried under a high vacuum (28" Mercury.)



The above cut shows a Vacuum Dryer installed on a 156" paper machine in the mill of Price Bros. & Co., Ltd., at Kenogami, P. Q., Canada. This installation was made in Dec. 1926. It has been in commercial operation for a long time drying standard news paper at a speed of 700 ft. per min. It has been subjected to every possible test for economy of steam, for freedom from mechanical troubles, for quality of paper produced, and for general machine efficiency. That it has passed all such tests is shown by the fact that

PRICE BROS. & CO., LTD., HAVE NOW SPECIFIED VACUUM DRYERS FOR TWO NEW 234" PAPER MACHINES

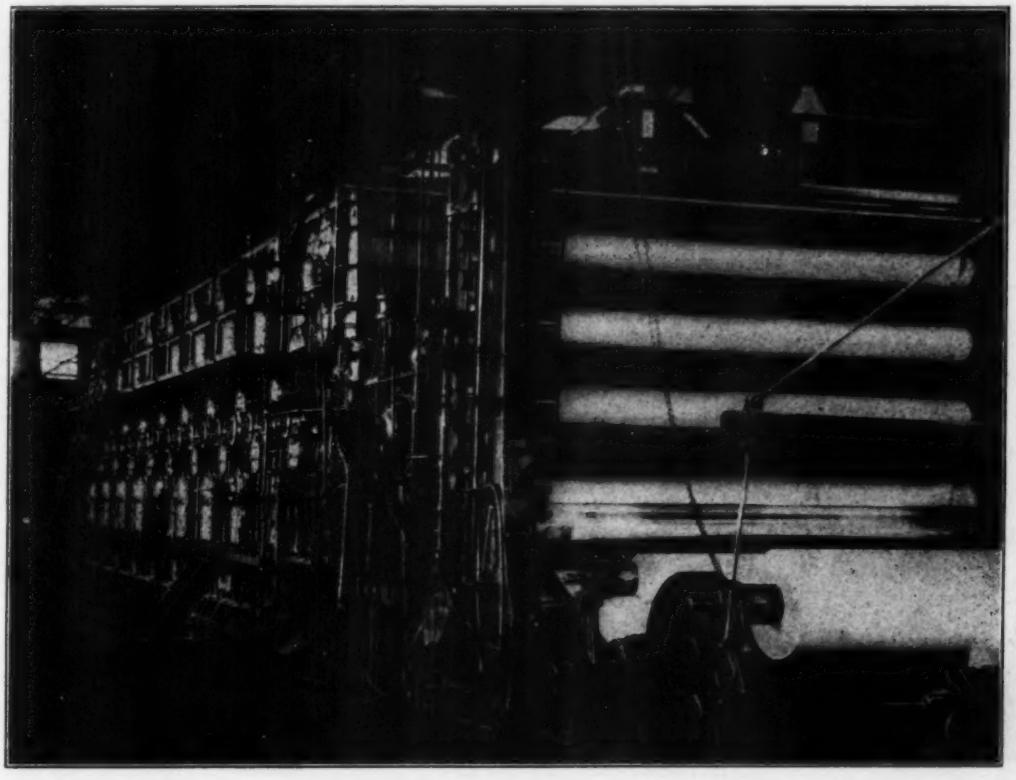
These new Vacuum Dryers will contain engineering features far in advance of present practice. They are being designed for a speed of 1200 ft. per min. They will be only half as long as a standard dryer of equal capacity. The problem of ventilating the machine room has been practically eliminated.

The economy of steam, floor space, felts, etc., heretofore claimed for the Vacuum Dryer have been absolutely proved by the Vacuum Dryer now installed.

Tests have shown that the Vacuum Dryer actually uses less steam than is theoretically needed by the standard bank of dryers to evaporate the water from the paper.

Minton Vacuum Paper Machine Dryer

Marks an Improvement in the Art of Paper Making Second Only to the Advent of the Fourdrinier Paper Machine Itself.



The above cut shows the dry end of the Vacuum Dryer shown on the opposite page.

The Vacuum Dryer is applicable to the dryin g of any kind of paper. Tub sized papers Vacuum Dried are in every particular the equivalent or better than loft dried paper. The paper is dried in reels and can be cut to suit the order. Large savings can be shown over loft drying.

Where the capacity of a paper machine is limited because of floor space, a Vacuum Dryer can be substituted for the standard bank of dryers and the speed and production of the paper machine doubled. In many cases sufficient steam will be saved to dry the additional paper.

Economies of operation have now been proved sufficient to warrant replacing the old type of drying equipment with Vacuum Dryers.

Paper makers are earnestly requested to look over their old equipment and determine for themselves if it will not pay to replace their dryers with Vacuum Dryers.

ENQUIRIES SOLICITED

Minton Vacuum Dryer Corp.,
Smith Building,
GREENWICH, CONN.

Minton Vacuum Dryer Co., (Canada), Ltd.
Drummond Building,
511 St. Catherine St., West
MONTREAL, P. Q., CANADA

ELECTRO BLEACHING GAS CO
MANUFACTURERS OF
Liquid Chlorine
9 EAST 41ST STREET
NEW YORK

E. D. KINGSLEY
PRESIDENT

February 20, 1928.

To the Convention of the
American Paper and Pulp Association:

The leaf has been turned on another year of accomplishment by the paper industry.

A review of the production record is a chronicle of success. Always conducted with expertness and precision, past operations reveal that the industry has been tenacious in adhering to the principles of progressivism.

This policy has brought its own rewards. Technical problems have been satisfactorily solved; and the industry is the richer for the bending of science to its will.

It has been the privilege of E B G to play a cooperating role for the benefit of the common interest. It is our desire also to make our services of still greater value to the industry.

This occasion, when paper mill executives meet in annual convention, is most appropriate for expressing our thanks for the good will displayed toward us. And to congratulate you upon accomplishment which points the way to a still greater and more prosperous future.

Cordially yours,

ELECTRO BLEACHING GAS COMPANY

E. D. Kingsley.

President

EDK:RAC

The Bête Noire of the Paper Industry

PRESIDENT D. C. Everest, in his masterly annual address to the American Paper & Pulp Association, among other good things, said:

> "We have built up through the co-operation of engineers, superintendents, technical staffs and machinery builders a highly efficient manufacturing department, capable of producing more products than ever before at lower costs. The machinery to accomplish such results is in constant motion."

Previous to this quotation, he said:

> "We have today a gigantic industry ranking seventh in the United States in the value of product. We have annual sales of paper products slightly in excess of one billion dollars. We have an estimated production capacity of twelve and one-half million tons annually. In 1927, we produced slightly under ten million tons or eighty per cent of capacity production."

To our notion, the most important message that President Everest brought to the paper industry, by citing these incontrovertible facts, was the devastating injury that is done the entire industry by apparently laying all emphasis on, and making all investment in, the production department of the business and practically ignoring the merchandising department.

The result has been **Over-production.** President Everest's figures show that we have erected a production machine producing 12,500,000 tons annually and yet under the stress of the keenest whip-lash competition that has driven the sales representatives of the various companies to the utmost endeavor, last year, they were only able to gather orders for the machine aggregating eighty per cent of the productive capacity.

The ills that have gripped the paper industry are the outcome of this over-produced situation and this over-produced situation is the outcome of senseless expansion of productive capacity far beyond the capacity of the country to absorb.

Now we submit that the sole reason for increasing the productive capacity of paper is the **production of profit.** No other sane reason exists for the investment of capital, energy and personnel except that productive capacity in the end produces profit. Herein lies the acid test, and when that test is applied to the paper industry, we find the industry generally profitless.

"A highly efficient manufacturing department in the paper industry capable of producing more products than ever before at lower costs," is the very machine, as President Everest properly states, that may efficiently and thoroughly wreck the entire industry; for, he goes on to say:

> "Are we to build up a gigantic machine, which, through our failure to regulate properly its production or to develop uses and market for its product, will destroy our business rather than make it more profitable?"

The Paper Industry deliberately stresses this portion of President Everest's analysis and warning to the trade. Our opinion exactly coincides with his, and we direct the attention of those manufacturers, who have embarked upon new ventures in productive paper capacity for the purpose of **lowering costs,** to the fact that the lower costs, which they seek to establish, depends entirely

EDITORIAL

upon marketing the capacity production; otherwise, the expanded productive capacity of paper becomes an **increased** cost factor instead of a **lower** cost factor.

Let us illustrate. The difference between the productive capacity of paper in 1927 and the actual production is 2,500,000 tons, which is equivalent to a daily production capacity of 8,000 tons. That excess capacity at the lowest possible calculation on the basis of the present cost per ton of the daily production is not less than five hundred million dollars. The investment of this sum in paper production should call for at least a five per cent return and a five per cent annual depreciation, or a total earning of fifty million dollars per year, but due to the fact that the production capacity is so greatly in excess of the capacity of the market to absorb, that investment is unproductive. Therefore, the fifty million dollars that should be earned on the excess production becomes a charge upon the actual production.

We say "becomes a charge upon actual production," but in several important divisions of the industry, it did not become such a charge because as the capacity production—for instance, in the kraft paper,—increased and the volume of orders decreased, the price declined and we witnessed that uneconomic procedure, attempting to reverse the operation of the economic law which governs production and merchandising.

Did the controllers of excess production get away with it? They did not! Neither will anybody else, for we state again that the economic rule for a situation of this kind is: when the volume of sales declines and productive capacity increases, the **price must advance.**

What the men who control the dominant lines of tonnage need to learn is that this economic law shows no clemency to any infractor of this rule no matter how big and powerful they may be or how wise and smart they think they are.

The facts remain that during 1927, as President Everest says, the machinery to accomplish **Over-production** was and is in constant motion resulting in heavier **Over-production.** The fact also remains that the hand-to-mouth-buying was more universally adopted by consumers, retailers, wholesalers and converters causing the volume of orders for future tonnage to further shrink, and in the face of this thing, one big division of the industry made a cut of ten dollars per ton. The penalty must be paid; the price for such folly is—**no profit.** The solution for the theorem should be apparent as the shortest distance between two points is a straight line.

President Everest has set the proposition clearly before his constituency. **Over-production** in the paper industry must cease. The South cannot put the North out of business and the Pacific Northwest must learn that it cannot put the North and South out of business, but these three great paper producing divisions of the country must learn that this internecine competition will result only in loss to themselves and disrepute to the industry which they have elected to function.

Profitless Prosperity

ANY ONE who attended the big conventions in New York in February, and noticed the real trend of affairs and main topics of conversation, must have realized that the most important topic was over-production. Second in importance to this topic was that of waste. These two subjects are closely allied. An industry that has a large over-production, with excessive costs of manufacture, or with costs which, in many instances are much larger than necessary, certainly has a difficult problem on its hands to solve. While perhaps this is not altogether a new question in this industry, it is now of more importance than ever before. The question of waste is an old one. Like the poor, it has always been with us. The trouble with waste is that the average mill man in many instances does not realize what his wastes are.

This article will deal with waste as applied to beating and refining of fibers. It is undoubtedly true that many of the average paper mill men go through their plants day after day, making the same observation, yet seemingly blind to wastes which would be plainly obvious to some one on the outside.

If it were possible for paper mills to employ a disinterested man who thoroughly understood this industry, have him go through the plant, ascertain the sources of waste and suggest improvements to eliminate this loss, the results would be surprising. Sooner or later, the mill that continues to suffer waste will find that the procession has passed by, and it will have a hard time hanging on at the rear.

Observation of Methods in Some Mills

Waste is not necessarily defined as material that is being thrown away. The unnecessary wearing out and replacing of machinery, resulting in excessive costs, may be counted one of the greatest forms of waste. In analyzing the man power necessary to the operation of a paper mill, the physical element is secondary. The most important requisite is what a man has in his head above the ears, and the way in which he uses it.

Not long ago a general superintendent in one of the big paper companies told his superiors that it was impossible to chop up fibers too fine in making their product. It was pointed out later that several carloads had been returned because there was no folding quality in the product, which, it was explained, was due to the fibers having been chopped too fine. Later, however, the entire system was changed and this mill is working along lines to brush out the fibers instead of chopping them, or, in other words, they are experimenting rather than acquiring any real knowledge of the subject. This illustrates the point that some men go through a mill and seemingly see all, hear all, and know nothing.

A boxboard plant recently visited, followed the usual custom of dropping the waste paper into a breaker beater. Of course, if the workmen found a brickbat, an iron bar or any large piece of foreign material, it was usually thrown out. Other ma-

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EDITORIAL

terials, however, such as ordinary dirt, sweepings, nails, tacks, bolts, bottles, old hats, old shoes, old corsets, bone, and many other different ingredients went into the beater. Just why the management of any mill will allow this kind of material to go into the system and start it down the line, then expect to get it out afterwards, is beyond understanding. It costs much more to take it out after it has gone in, than if it were taken out before.

A man would find considerable fault if such a slip-shod system was practiced in his home. For instance, if the wife was preparing soup, he would expect the meat, vegetables, etc. entering into it to be thoroughly clean and free from refuse. The cook would indeed be subject to severe criticism if the ingredients were put into the kettle without cleaning and the soup served in that manner.

Another instance is recalled of a visit to a mill where everything except large pieces went into the breaker beater, were dumped down into the chest, then pumped up into another beater, and after beating a short while, they were again dumped and pumped through the jordan. During this process, there was a terrific noise. Men rushed over to one of the jordans and closed it down. Upon opening it, they found that a lot of the bars had fallen down, which had been caused by a large sized bolt which was in the stock. All of the bars in the jordan were badly chewed, not only from this one bolt, but from many which had gone through before. It was said that six weeks was the average life of a filler and plug in the jordans in this mill. Compare this with the experience of another mill which was visited, where it was stated the jordans had not been opened up for about eighteen months. In other words, this one mill was running its jordans about eleven times longer than the other one and still going good. Multiply the cost of a jordan lining and plug by eleven, and it will be easy to see how much one of these mills saved over the cost of wastes. Then multiply this by six, which is the number of jordans the mill has, and the result will show the tremendous sum of money lost to the one mill simply by dumping dirt and refuse into their system.

The other mill referred to did the same thing, but they washed it out thoroughly after it went through their breaker. This other mill had the cost of removing it before it went into the system, other than breaker beater, which was a much better plan than the other mill which allowed it to go on through the whole system and try to take it out afterwards. The cost would have been much less to the latter mill, if the material had been cleaned before starting in the system at all.

The mill above mentioned which fills its jordans on an average every six weeks, had other tremendous costs on account of the filth and dirt that went into its system, aside from the jordan. The beater bars were ground down constantly, and necessitated repairing. A lot of foreign matter was cutting the screens, getting over onto the paper machine, cutting the cylinder wires and felts, and going so far as to scratch up the calender rolls. There is a constant flow of calender rolls to the grinding department to smooth them down. This means money. There is a constant covering of cylinder molds, and this also costs money. This mill puts many new felts on the machines, which would be unnecessary if the stock was cleaned.

In conversation with a mill man in Pennsylvania along these lines, the question of the use of a certain machine came up. He inquired if the machine of a certain manufacturer could handle his product, which contained old hats, old shoes, old corsets, bottles, bones and all kinds of metals, etc. The writer replied he had no knowledge of any machine intended to handle that type of material; that it would seem something was wrong with the management of a mill that would allow such material to be thrown into the system at all. Just why these things are done, it is hard to say, except for the reason that such methods have become a habit. This is a very poor excuse.

Other Forms of Waste

Another tremendous waste in many mills is the method that is used in handling the stock. A large number of mills, for instance, use old magazines, etc., in their book stock. The ordinary method of treatment is to steam up this stock in a rotary, with soda ash to release the ink, then wash out this fiber. This brings to mind, the method used by a mill visited a short time ago, which is typical of many others. After this fiber was washed and bleached, it was put into a beater until the beater was about three-fourths full, and sulphite pulp added to make up the remaining 25 per cent. As this was being done, the superintendent was asked how long he beat that stock. He said, "Three and a half hours, it should be four and a half hours." The writer replied it seemed ridiculous for a paper mill to take old stock that had already been on a paper machine, the fibers of which were fine enough at that time, and to cook it up and soften it, then put it in the beater and manipulate it for at least three and a half hours. He stated this was what they had always done, and it seemed to be what most of the other mills are doing. A plan was suggested whereby this method could be changed at a considerable saving resulting in a much better sheet. On a later visit to this mill, it was found they had used the suggestion offered them, were saving a lot of power, and they stated their sheet was about 30 per cent stronger than it had been before with the same stock.

Another superintendent was interviewed and found to be doing the same thing. Upon being asked why he did it, he replied, "We have always done it that way." Our forefathers traveled by ox-teams or dobbin and the old shay. We do not travel that way any more. Times have changed, and conditions in paper mills must change if these mills are to keep up with the procession.

Is it, then, any wonder that many mills run all of the time, and at the end of the year find that, due oftentimes to excessive costs, much of which might have been avoided, their seeming prosperity has been profitless.

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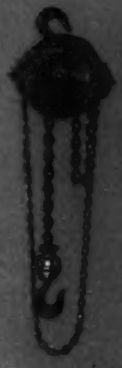

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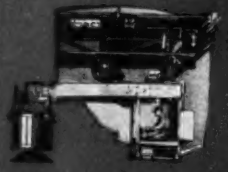

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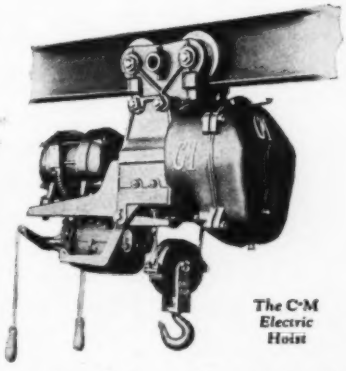

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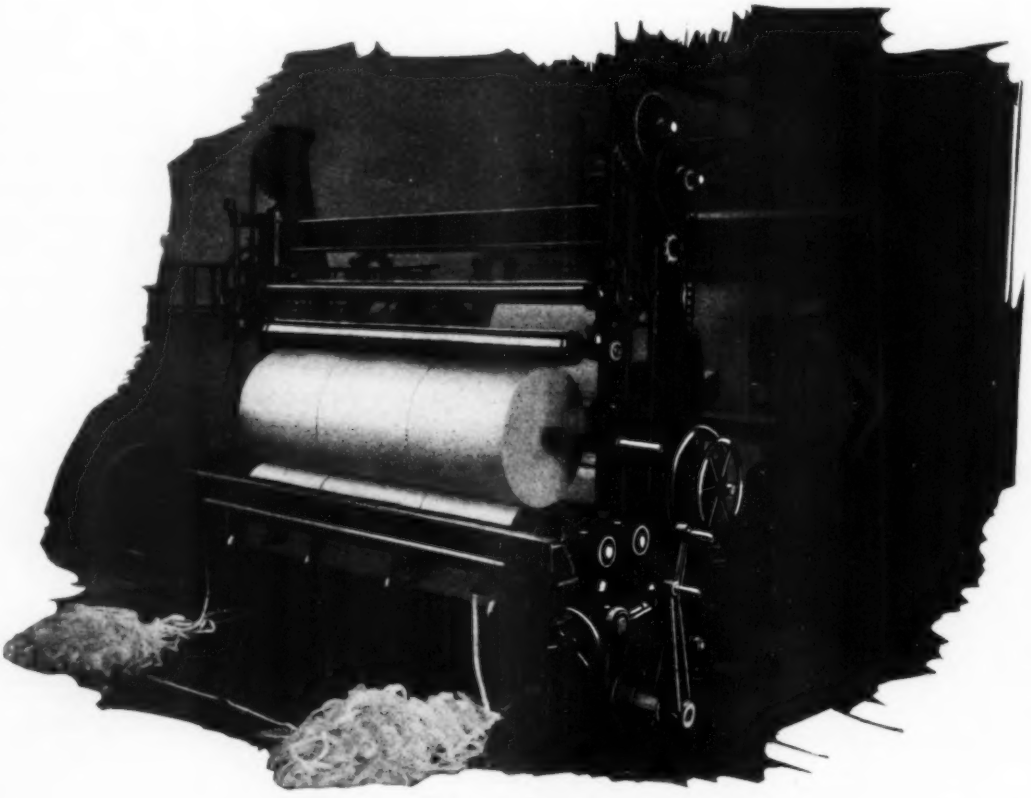

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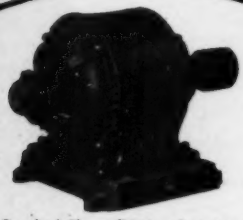

The Standard Sleeve Bearing American Motor is 95% enclosed. Frame is splash-proof. Single piece bronze bearing can be replaced in less than ten minutes. Oil flow is so directed that oil cannot get into windings.

The Standard Ball Bearing Motor is 95% enclosed and splash-proof. Motor can be disassembled without removing bearing case from shaft. Hoods can be removed without exposing bearings.

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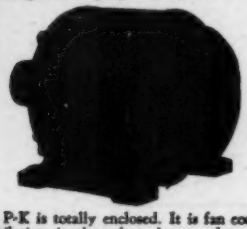

The P-K is totally enclosed. It is fan cooled. Ventilation is *through and over the stator laminations, removing the heat at the point where it is generated.* Windings are completely sealed. No dust, moisture or fumes can get to them. It has a 40 degree rating.

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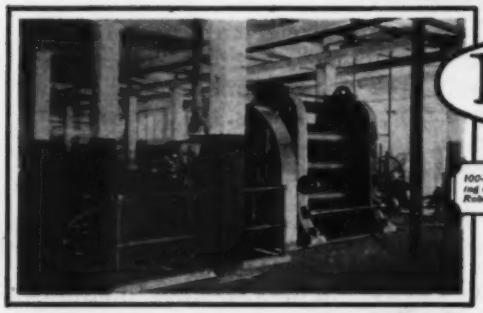
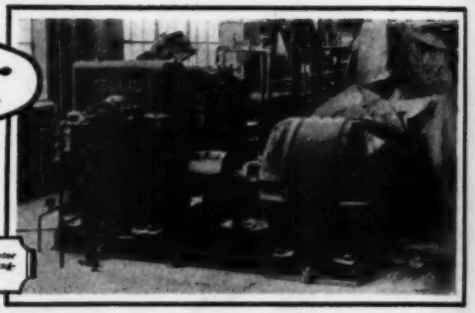


100-hp., 335/900-r.p.m. motor driving calender. *New England Tire and Rubber Company*



40/75-hp., 575/1150-r.p.m. motor driving tube machine. *Kelly-Springfield Tire Company*

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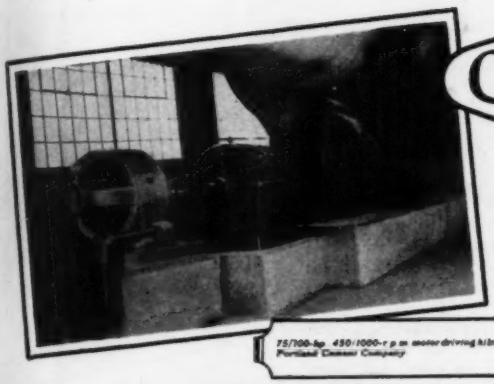
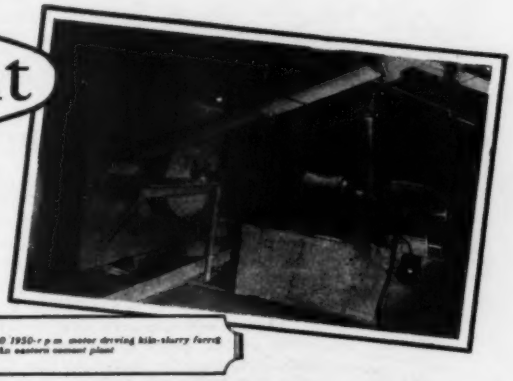
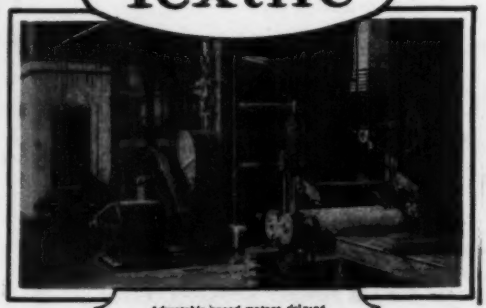


75/100-hp. 450/1000-r.p.m. motor driving kiln. Phoenix Portland Cement Company



3-hp., 450 1950-r.p.m. motor driving kiln-slurry feed wheel. An eastern cement plant

Textile



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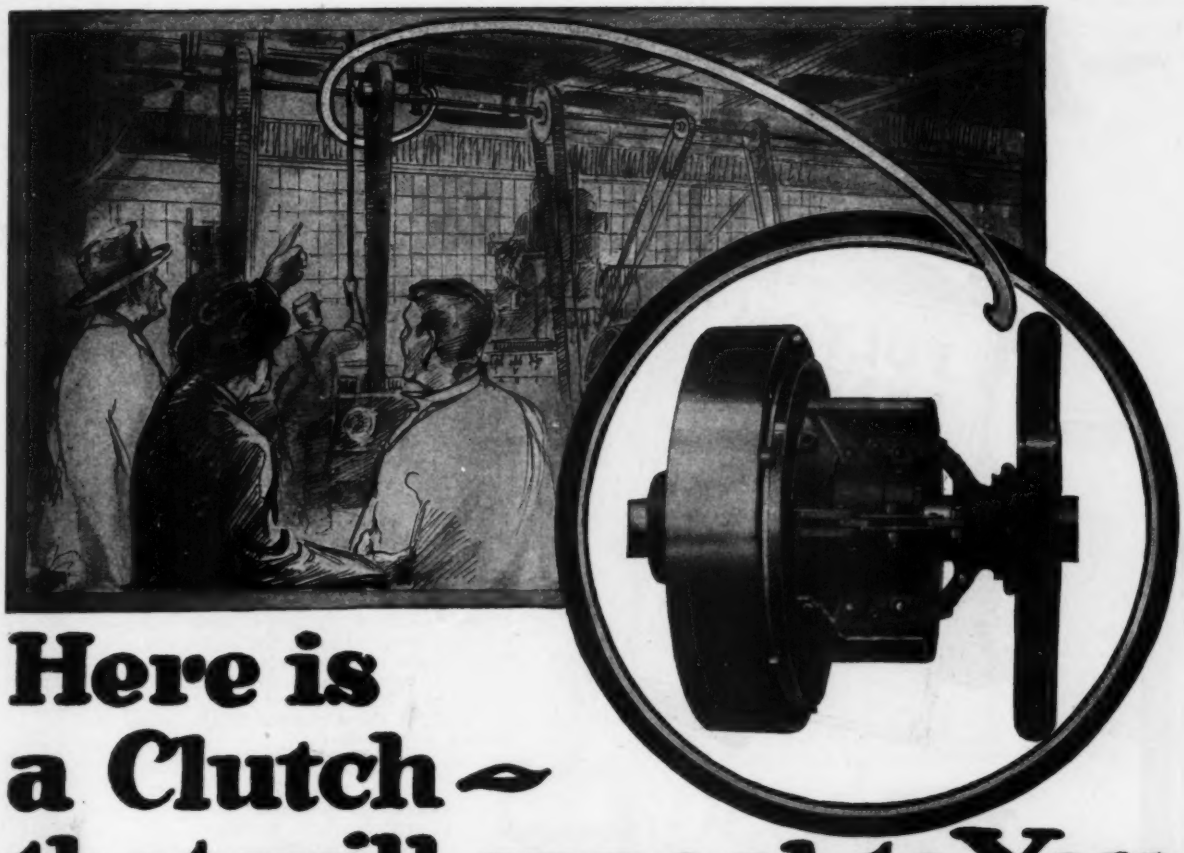

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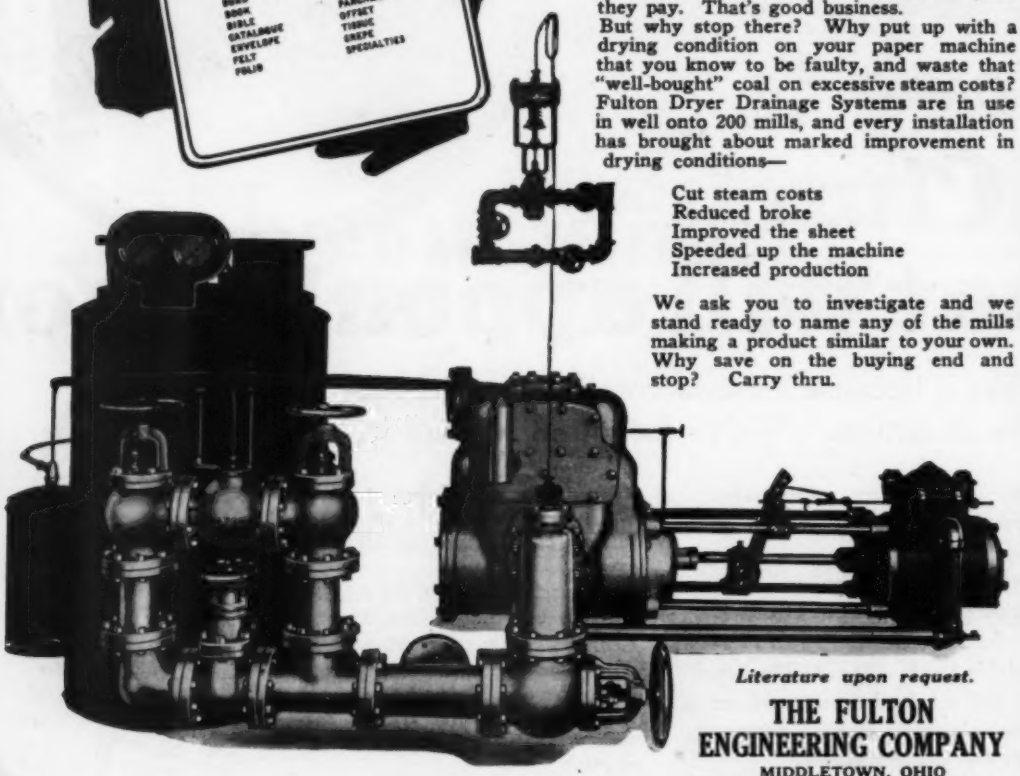

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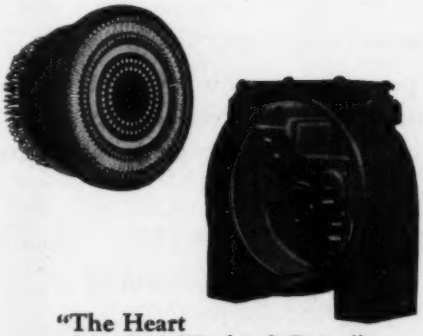

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4. All the advantages of ball bearings which are fully protected against dirt.

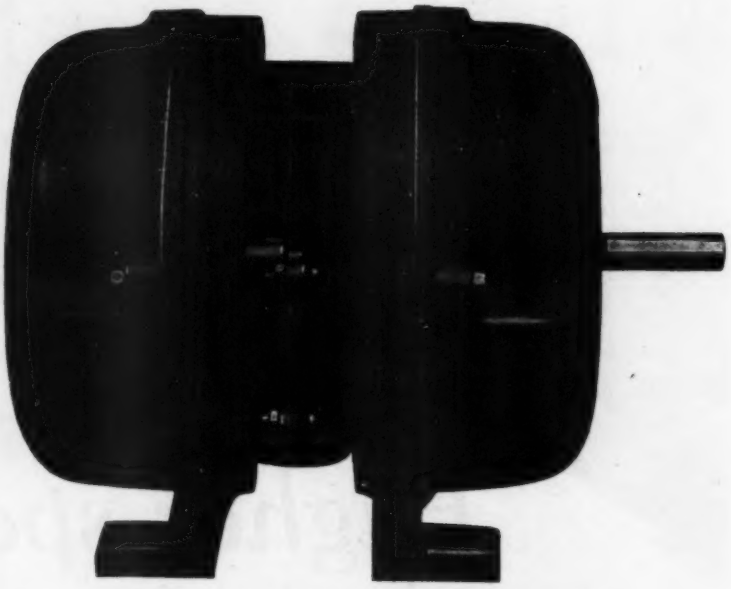
5. All fully-enclosed motor advantages without excessive increase in motor size and weight and at low cost.

6. Motors are interchangeable in all mounting and limiting dimensions with standard open motors of the same frame size.

7. All additional parts required are inside the bearing brackets and are fully protected.

8. External fans at both ends give uniform cooling. The heat flow is outward from all parts of the motor.

9. Electrical and operating characteristics are exactly the same as those of open motors.



The Reliance fully-enclosed fan-cooled construction offers the easiest way to reduce maintenance costs and prolong the life of your induction motors. You can place the motors in dirty locations and be sure that the windings will stay clean.

You get this protection at low cost and in most cases without increase in size over an open motor of the same rating. No pipes, no complicated construction.

For details get Bulletin 102.

RELIANCE ELECTRIC & ENGINEERING CO.
1058 Ivanhoe Road, Cleveland, Ohio

Branches: Boston, New York, Buffalo, Pittsburgh, Philadelphia, Birmingham, Cincinnati, Detroit, Chicago

RELIANCE A-C D-C MOTORS
with Ball Bearings

for Every Paper Mill Drive

D. O. James Herringbone and Planetary Speed Reducers on Conversion Save-all Drives.

A 10 H.P.-96 to 1 Ratio James Planetary Speed Reducer, driving a paper and rag sorting conveyor.

A Chip Conveyor drive in an Eastern pulp mill uses a James Heavy Duty Worm Gear Speed Reducer

Agitator Cooking drives using James Planetary Spur Gear Speed Reducers.

ON packer screens and filters, stock and stuff chests, conversion save-alls, agitators and cookers, elevators and conveyors—wherever a reduction in speed is required—use a James Speed Reducer.

We are manufacturers of every type of speed reducer. Instead of having to furnish a unit that does not apply, we are able to furnish the proper reducer, for each specific drive, as dictated by our twenty-five years engineering and manufacturing experience.

There are over 35,000 James Speed Reducers used by industry today on drives of every nature. Many of these have given as high as twenty years uninterrupted service without repair or maintenance. They are made in types to suit every condition of drive—Herringbone, Planetary Spur Gear and Worm Gear—to drive up, down, at an angle, or in a straight line—for light, medium or heavy duty, in all ratios and sizes up to 1000 hp.

Let our engineering department help you select the proper unit for your work.

D. O. James Manufacturing Company

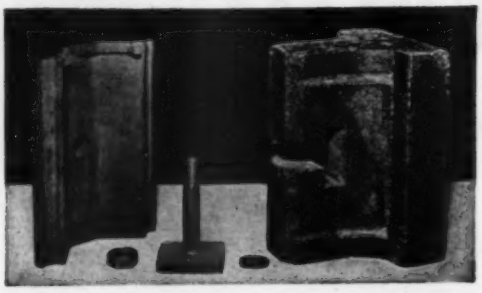
1120 West Monroe Street
CHICAGO

Local Offices in

NEW YORK	DETROIT	SAN FRANCISCO
BUFFALO	PHILADELPHIA	SEATTLE
CLEVELAND	CINCINNATI	PORTLAND, ORE.
PITTSBURGH	ST. LOUIS	LOS ANGELES
MINNEAPOLIS	BIRMINGHAM	SALT LAKE CITY

D.O.JAMES

An important development in water wall design—



BERNITZ CARBORUNDUM BLOCKS *(Thayer Type)* **for WALL TUBES**

Important advantages of this design are (1) high furnace temperatures and complete combustion in close proximity to fire face of walls, (2) intimate contact readily obtained for blocks to entire tube area, (3) ease of erection, (4) tube protection, and (5) proper allowance for expansion stresses, **all reflecting economy in steam cost and maintenance.**

We furnish spacer and supporting bars, **blocks,** backing plates, and bolts, i.e., everything necessary for the complete erection of the Blocks.

Our new Bulletin B-7 will give you complete information. A copy is yours for the askng.

BERNITZ FURNACE APPLIANCE COMPANY

80 Federal St.
Boston, Mass.

New York City · Philadelphia · Detroit · Chicago
Pittsburgh · Cleveland · Atlanta · New Orleans
St. Louis · Salt Lake City · San Francisco

"There is a Bernitz type of wall for every furnace."

The "Siamese Twins" *of* Production Costs—

WHETHER the paper mill balance sheet shows a "net profit" or a "net loss" for the year is frequently dependent on the cost of *power and heat.*

These are the "Siamese Twin" essentials of paper making. They have their origin in the same source—the burning of fuel. To separate them for purposes of determining costs is to distort the problem. They must be considered *together* in any successful plan of cost-cutting.

And, together, they may represent as much as 40% of the total production cost of each ton of paper or pulp. They are worthy of a generous share of attention and study.

An impressive number of mills whose executives have learned to keep power-heat costs at a minimum are operating Edge Moor Boilers. Each year sees substantial additions to this list.

"Power—Shall We Buy It or Generate It?" is a booklet well worth the reading to any paper mill executive or engineer. There's a copy here for you.

Seven Edge Moor Boilers, of 509 b.h.p. each, have given many years of excellent service in the mill of P. H. Glatfelter & Company, Spring Grove, Pa.

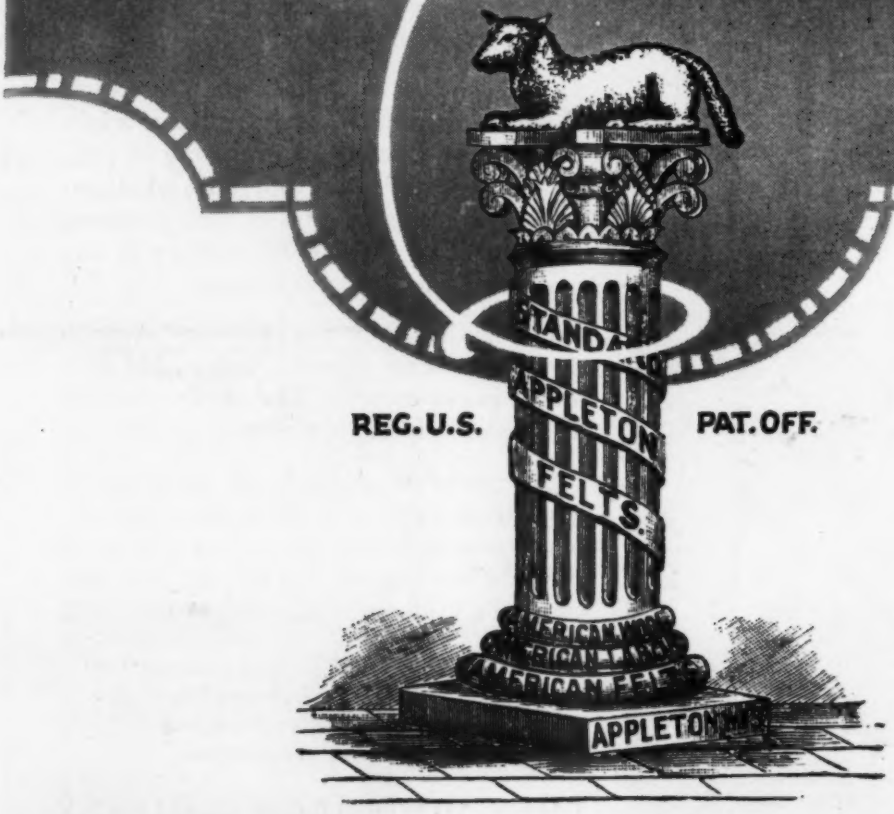
EDGE MOOR IRON COMPANY
Established 1868
EDGE MOOR, DELAWARE

New York Chicago St. Paul Boston
Pittsburgh Charlotte Los Angeles

EDGE MOOR Water-Tube BOILERS

FOR INCREASED FUEL ECONOMY

Let us show you what *this* Trademark



On Felts means to you

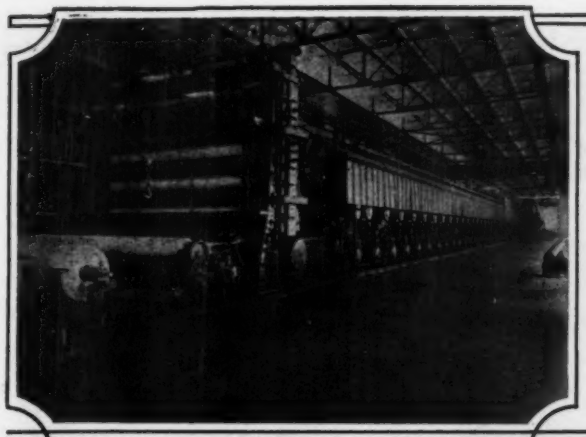
First of all it means service such as only a high grade pure wool can give. And, second, it means that 37 years' experience in making felts and solving felt problems is back of this trademark on Felts. In addition, it means Appleton Felts and Jackets have durability, adaptability, accuracy, design, finish—and all outstanding reasons for the wide acceptance of Appleton Felts by paper mills throughout the country.

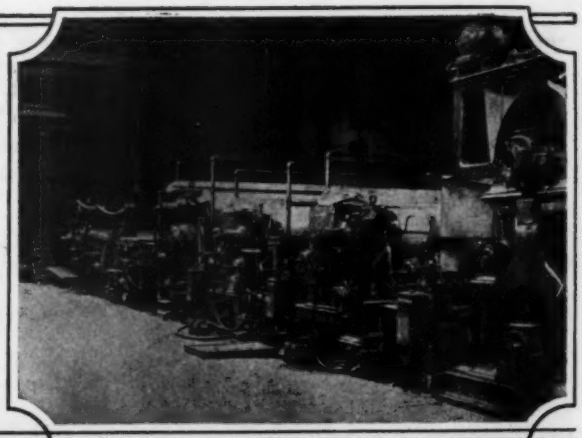
APPLETON WOOLEN MILLS

APPLETON, WISCONSIN

Appleton

Felts and Jackets





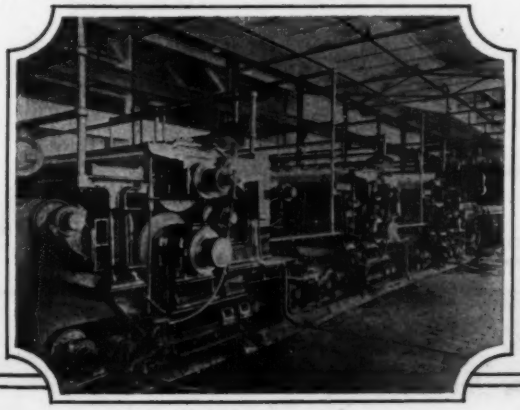
NEW RICE-BARTON MACHINES STARTED IN 1927

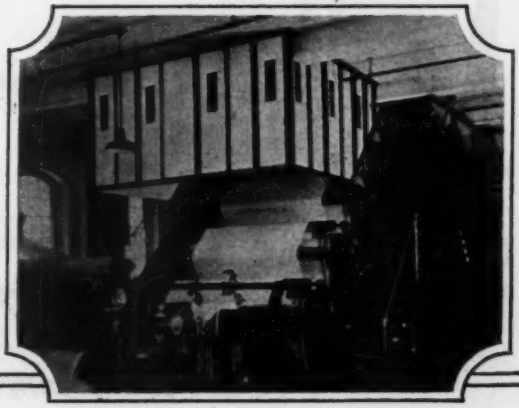
A total wire width of 912 inches

1837 1928

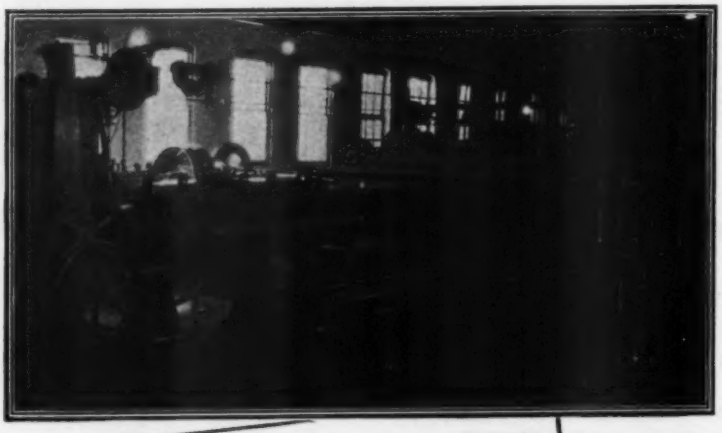
For new installations and replacement work you will find us ready with complete engineering and manufacturing facilities—backed with 90 years' experience.

RICE BARTON & FALES INC.
WORCESTER
MASSACHUSETTS





Nothing we could say . . .



would be as convincing as this . . .

BEMIS BRO. BAG CO.
MANUFACTURERS
BURLAP-COTTON-PAPER BAGS
BURLAP IMPORTERS

PEORIA, ILL., U. S. A.

January 31, 1928.

The Black-Clawson Co.,
Hamilton,
Ohio.

Attention: W. L. Reiter

Gentlemen:

Under separate cover I am sending you a sample of the kraft paper made on the new Fourdrinier.

We started up this machine yesterday without any trouble at all. After making one or two adjustments on the dryers and Sheaban Carriers, we got the paper over the reel and have been running without a break ever since.

I am certainly very much pleased with the Reiter-Sandall Fourdrinier.

We are running at a speed of 260 feet with five-sixteenths shake on the breast roll, running at 300 shakes per minute. I expect to get the speed up to 300 feet or over next week, but it will require a pulley change on the variable speed line shaft.

The sample sheet sent you is 40# basis weight and has a Mullen test averaging 48, machine tensile 36, cross tensile 22, and a tear each way of about 60 grams.

We consider the sheet superior for our purposes than the paper we have been buying from two different mills the past year.

Yours very truly,

BEMIS BRO. BAG COMPANY

(Signed) E. B. Roberts.

After all, it isn't what we say about a piece of equipment, but what the customer, who looks to the machine to make money for him, says. That's why we take such pleasure in reproducing the letter above which we received recently from the Bemis Bros. Bag Company.

In another letter, which we received a week later, there is this paragraph: "The machine has been running nicely all week. We now have the speed up to 295 feet. We are making excellent paper for our purpose, and considerably better, in our opinion, than any we have been able to purchase."

Why not let us give *you* the complete facts about this new Champion Fourdrinier, the most revolutionary step in paper making since the development of the first Fourdrinier.

The Black Clawson Company
HAMILTON, OHIO
Established 1875
Export Offices: 15 Park Row, New York City

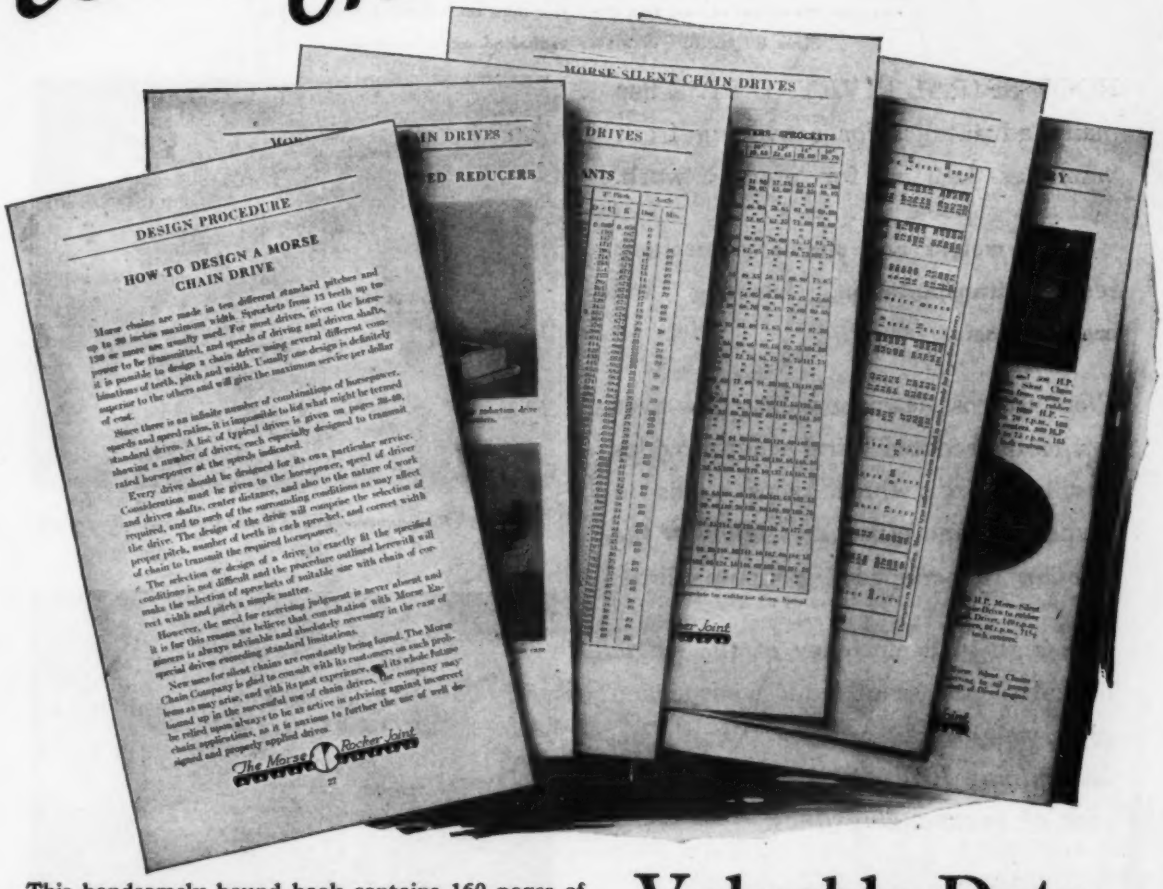
Builders of highest quality paper and pulp mill machinery
Patentees and sole builders of Vertical Dryers and Champion Fourdriniers

BLACK-CLAWSON

CHAMPION FOURDRINIERS

Built with Machine-Tool Accuracy

A New and complete handbook on Morse Drives!



This handsomely bound book contains 160 pages of engineering data, facts, tables and illustrations that will greatly facilitate the designing of Morse Silent Chain Drives. It is thumb-indexed and so arranged that engineers may easily refer to it in selecting and designing the proper power drives for their requirements.

Whatever your power drive requirements, this complete handbook will prove a valuable reference in your files. Fill in the coupon and get your copy now.

MORSE CHAIN CO., ITHACA, N. Y., U. S. A.

Branches in Principal Cities

MORSE SILENT CHAIN DRIVES

2327

Valuable Data for you—

MORSE CHAIN CO.
ITHACA, N. Y.

Please send me a copy of the new and complete handbook of Morse Drives.

Name.....

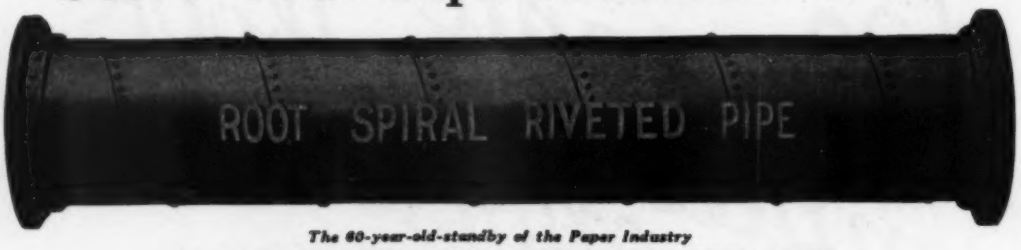
Position.....

Company.....

Address.....

PI

Solve Your Pipe Problems With



The 60-year-old-standby of the Paper Industry

AN ABSOLUTELY TIGHT DURABLE PIPE

Fully 50% Stronger than Straight Riveted Pipe of Equal Thickness

One-fifth the weight of Cast Iron Pipe. One-third the weight of Wrought Pipe.

Sizes 6" to 30" diameter asphalted or galvanized

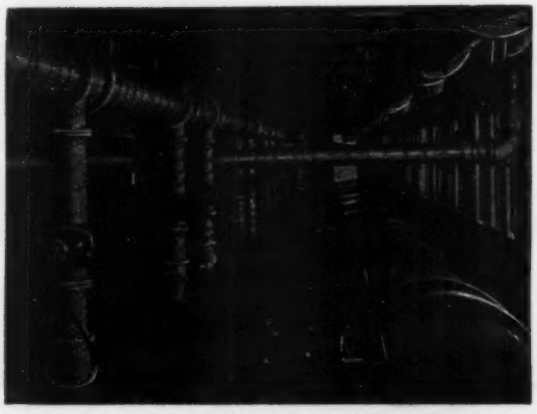
ROOT SPIRAL RIVETED PIPE has many advantages for conveying fresh water as well as for process work.

Light weight and simple connections reduce transportation, handling and erecting costs.

With no cross seams, the easy flow over a smoothly coated spiral seam provides a rifled effect which keeps solids in suspension and *eliminates much of the friction* experienced in pulp lines.

The high load efficiency of the single helical riveted seam reduces suspended pipe weight by at least two-thirds, *minimizing load stress problems and cost of overhanging lines.*

A 30-inch Root water supply line in paper mill service



Root Spiral Riveted Pipe in the Beater Room

CATALOGUE

Our 96 page catalogue includes a brief non-technical description of many diversified applications of Root Pipe and copy will be mailed upon request.

Great Strength, Light Weight, ease of installation, durable coatings and low frictional resistance all contribute to the popularity of Root Pipe in the pulp and paper field.

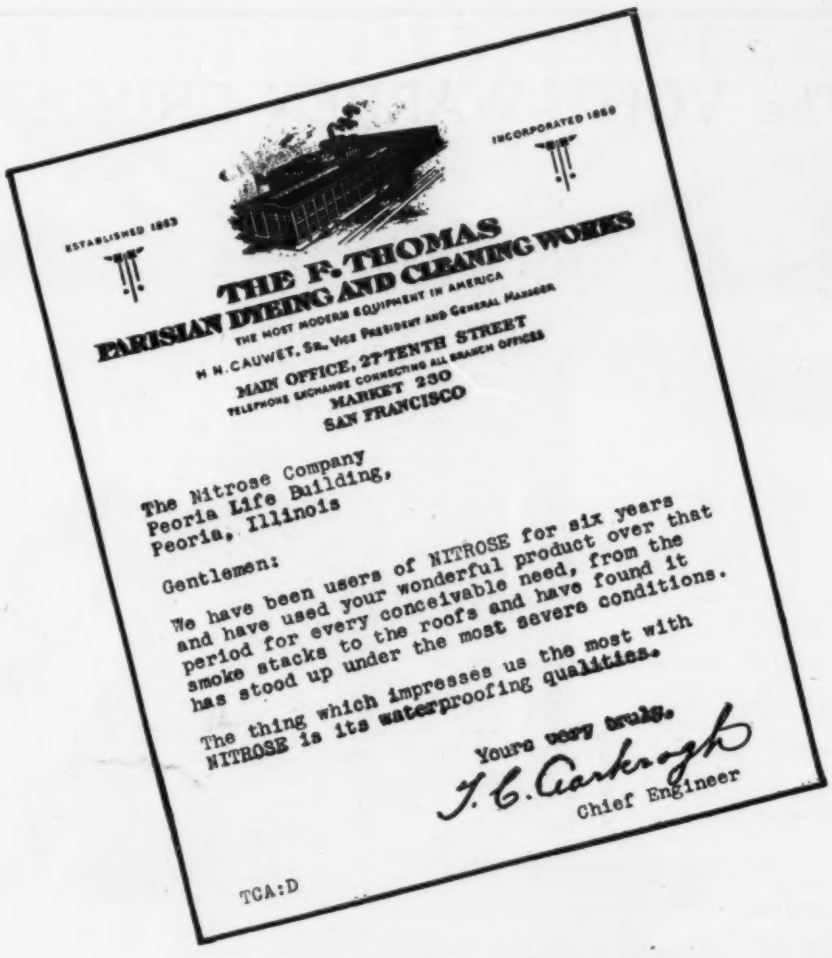
Abendroth & Root Manufacturing Co.

Pipe Specialists Continuously Since 1857

233 BROADWAY, NEW YORK, N. Y., U. S. A.

MILLS—NEWBURGH, NEW YORK

See page 306 in the Paper and Pulp Mill Catalogue



ESTABLISHED 1863 INCORPORATED 1868

THE F. THOMAS
PARISIAN DYEING AND CLEANING WORKS
THE MOST MODERN EQUIPMENT IN AMERICA
H. H. CAUWET, Sr., Vice President and General Manager
MAIN OFFICE, 27 TENTH STREET
TELEPHONE EXCHANGE CONNECTING ALL BRANCH OFFICES
MARKET 230
SAN FRANCISCO

The Nitrose Company
Peoria Life Building,
Peoria, Illinois

Gentlemen:

We have been users of NITROSE for six years and have used your wonderful product over that period for every conceivable need, from the smoke stacks to the roofs and have found it has stood up under the most severe conditions.

The thing which impresses us the most with NITROSE is its waterproofing qualities.

Yours very truly,
T. C. Cavanaugh
Chief Engineer

TCA:D

WRITE

Tell us what your corrosive problem is. Our engineers want to tell you why it will pay you to put NITROSE on the job. No obligation.

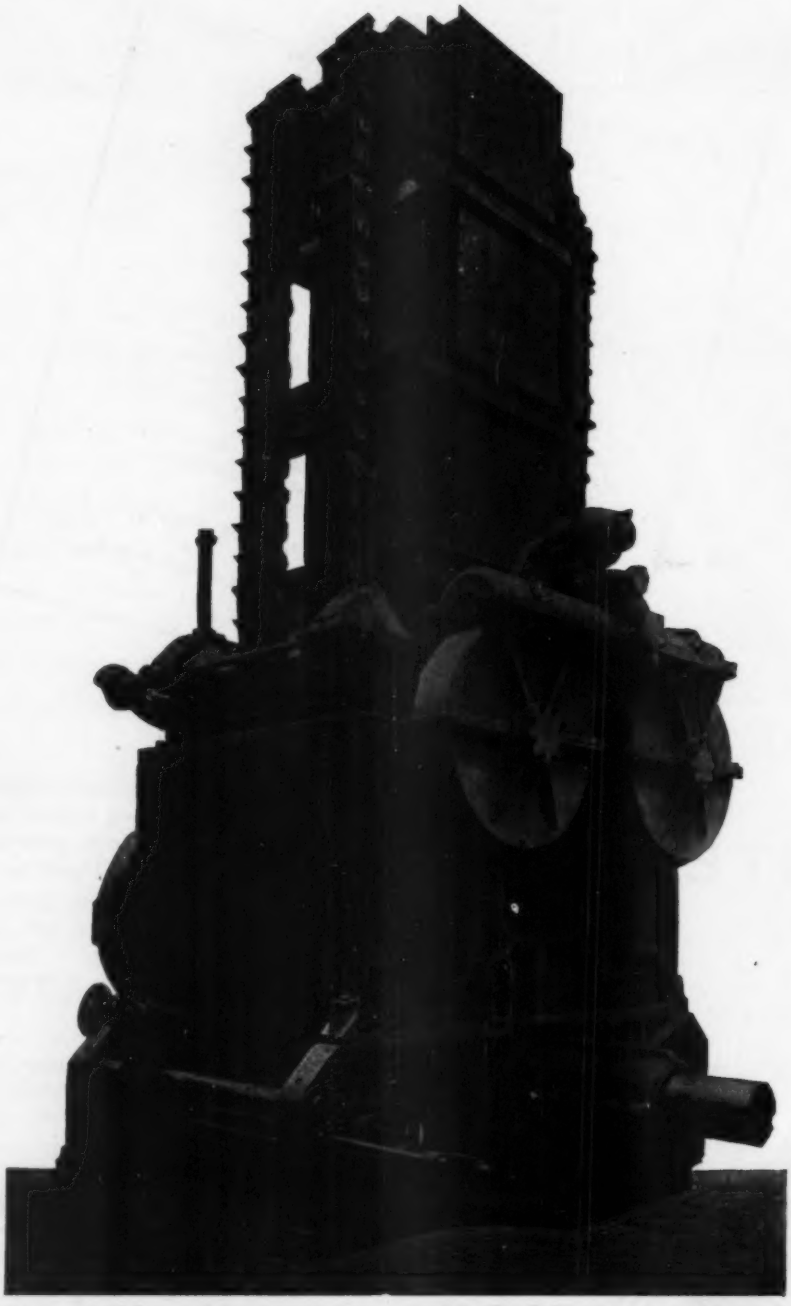
NITROSE is the rust-resisting liquid armor that spreads like paint. Costs less by saving labor, going farther, lasting longer. Corrosion cannot eat NITROSE. Welds itself down into hot or cold bare metal, through water, oil and rust; dries hard and forms a film of protection against water, heat, rust, grease, gas, chemicals, acid fumes, brine, salt, ammonia and alkalis. Elastic, does not crack or peel. Needs no primer, thinner, sand blasting or extra material. NITROSE is needed every place where corrosion is a problem.

Instant shipment in cans or drums from Peoria, New York, Rochester, Cleveland, Detroit, Kansas City, Seattle, San Francisco, Los Angeles.

The NITROSE Company
1500E Peoria Life Bldg. Peoria, Ill.

NITROSE

The VOITH-WARREN GRINDER



AMERICAN VOITH CONTACT COMPANY, Inc.

280 Madison Ave. New York City

Chain Mortality Decreased-

by Balanced Construction

Balanced Chain Design, in which all parts are properly proportioned to carry the load, predetermines a long life for Jeffrey Chains.

They are designed to equally withstand the stresses of the several mechanical forces to which they are subjected, such as tension in the side bars, bending and shearing of the pins and bushings, fixed bearing of the pin in the side bars and wearing between the pins and the bushings. In balanced construction, there is no excess weight of metal.

These are a few of the reasons why Jeffrey Chains replace themselves. For example, Mr. P. A. McLeod, Engineer, Northern Indiana Public Service Company, says, "The first Jeffrey Elevator installed at our Lafayette plant remained in active service several years longer than we could reasonably expect, therefore, it was only logical that we should choose Jeffrey Chains and Buckets to replace it when worn out."

Our new Chain Catalog No. 416-K makes it easy to select the Jeffrey Chain you need. May we send you a copy?

The Jeffrey Manufacturing Company

944-99 North Fourth St., Columbus, Ohio

New York	Boston	Chicago	Salt Lake City
Buffalo	Scranton, Pa.	Charleston, W.Va.	Los Angeles
Rochester, N. Y.	Cincinnati	Milwaukee	Birmingham
Philadelphia	Cleveland	St. Louis	Charlotte, N. C.
Pittsburgh	Detroit	Denver	Montreal

51 YEARS OF SERVICE TO INDUSTRY

JEFFREY

MATERIAL HANDLING EQUIPMENT

Jeffrey Products

Elevators
Conveyors
Portable Loaders
Coal and Ashes Handling Equipment
Skip Hoists
Chains and Attachments
Sprocket Wheels—Gears
Crushers—Pulverizers
Sand and Gravel Handling, Washing and Screening Equipment
Locomotives
Coal Mine Equipment
Tipple Equipment
Ventilation Fans

Hard iron··soft paper stock
—who would give Jordans both?

WHO would give beaters and Jordans or any other machine materials as hard as iron and as soft as paper stock? Yet—hundreds of tons of stray iron do go into beaters and Jordans every day, causing irreparable loss—damage that Dings Magnetic Separators could prevent surely and cheaply.

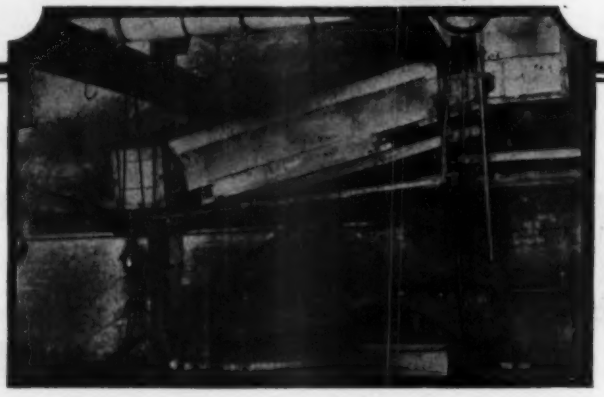
No beater or Jordan can withstand the racking, tearing action of nails, bolts, wire, jack knives, the stray iron inevitably found in paper raw stock, pulp, rag, and waste paper. Jordan bars wear and break, beater bed plates give way, letting the paper stuff slip through partly refined, causing costly repairs, replacements, and plant delays.

Let Dings Separators end this drain on profits and plant efficiency. No iron can pass the powerful Dings Magnetic fields—every bit is seized and thrown aside.

Dings Magnetic Separation is as necessary for paper machinery protection as lubricating oil. Find out from Dings engineers, with no obligation, how it can be just as profitable.

DINGS MAGNETIC SEPARATOR CO.
665 Smith Street Milwaukee, Wis.
Established in 1899
Branch Offices in Principal Cities

Dings High Intensity MAGNETIC SEPARATION



New York
30 Church Street

San Francisco
419 Call Bldg.

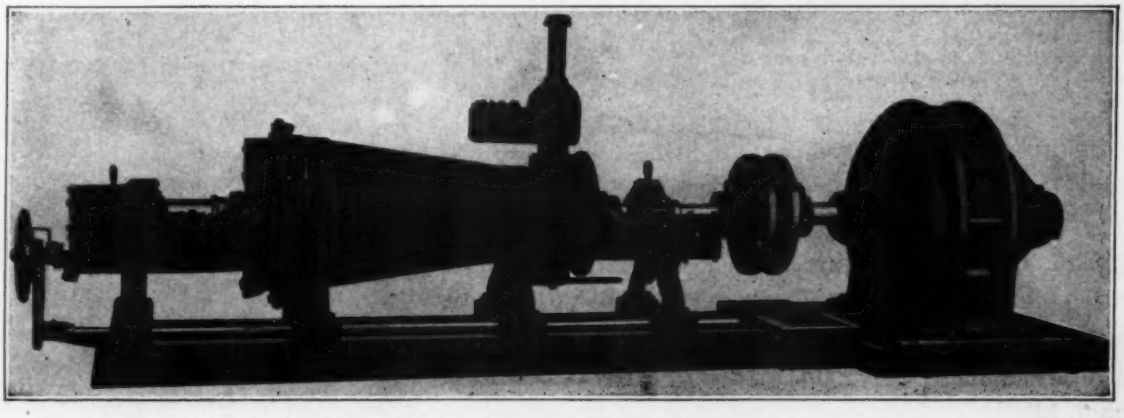
Boston
304 Rice Bldg.

Seattle
2208 First Ave., S.

P13-Gray

..Improved Jordan Performance Pays....and Pays...

OF most importance to the maker of quality paper is the uniform refinement of the stock possible with the Ball Bearing Type Appleton Jordan Engine, a uniformity impossible with the plain bearing Jordan. The permanent centering of the plug and accurate adjustment assure continuous uniform refinement and a uniform product. For those who measure performance in dollars saved, the saving with the Ball Bearing Jordan in power consumption, filling replacement, maintenance costs and lubrication is important. On one particular installation it is $948.58 ANNUALLY. For the paper-maker the Ball Bearing Type Appleton Jordan is a tool of the utmost accuracy and economy with which to prepare his stock.



The Ball Bearing Type Appleton Jordan Engine

A folder explaining why the Ball Bearing Type Appleton Jordan Engine gives improved Jordan performance will be sent on request.

THE APPLETON MACHINE COMPANY

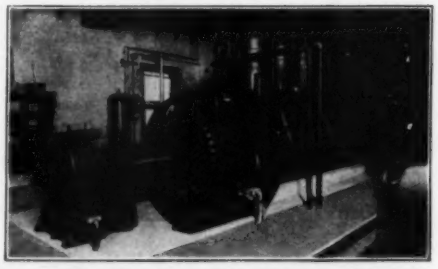
Appleton, Wisconsin

Positive Lubrication *with Nonpareil Diesel Oil*

CORRECT lubrication of Diesel Engines requires the use of highly refined oil of proper viscosity.

Excessive carbon formation around piston rings and at the ports results not only from using improperly refined oil, but from the use of oil of incorrect viscosity.

Too heavy an oil increases carbon formation which reduces engine efficiency. Too light an oil burns on the cylinder walls leaving them dry. This causes premature wear.



Type Y, 240 H. P. Fairbanks-Morse Engine in the City Light & Power Plant, Tyler, Minnesota. "Nonpareil Diesel Oil used exclusively."

To operate at peak efficiency with minimum repair and replacement costs, Diesel Engines must be lubricated with an oil which maintains proper viscosity at operating temperatures. The oil must be so refined as to minimize carbon formation.

15 and 25 H. P. Fairbanks-Morse Engines in the Light Plant at Arco, Minnesota. "Highly satisfied with Nonpareil Diesel Oil."

Nonpareil Diesel Oil is refined with extreme care to reduce to a minimum the presence of carbon forming elements. The expense of frequently cleaning carbon from valves and ports is practically eliminated by the use of Nonpareil Diesel Oil. This lubricant maintains proper viscosity at operating temperatures, thus assuring positive unfailing lubrication at all times.

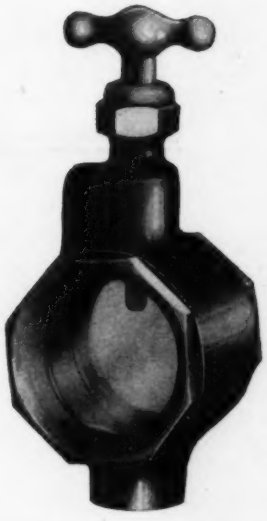
Dr. Denton Sleeping Garment Mills, Centerville, Michigan, use Nonpareil Diesel Oil in their 200 and 100 H. P. Fairbanks-Morse Engines.

Let us prove by actual test in your plant how you may obtain maximum efficiency from your equipment by using Nonpareil Diesel Oil. A member of our Engineering Staff, thoroughly trained in the lubrication requirements of Diesel Engines, will conduct the test. To avail yourself of this service costs you nothing, nor does it obligate you in any way. Just phone or write our nearest branch office.

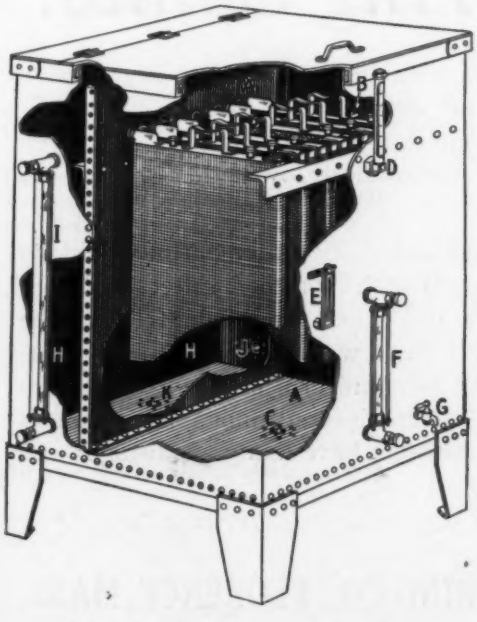
STANDARD OIL COMPANY

(INDIANA)

General Offices: 910 S. Michigan Avenue **CHICAGO, ILLINOIS**



This is the Bowser sight feed oiler—a sturdy and dependable unit in the Bowser system.



This filter is the "heart" of the Bowser circulating system. It purifies the oil and keeps it continuously in use.

"3 gallons of oil used weekly in lubricating 276 bearings"

LUBRICATION of the bearings of the dryers, in the plant of the Franklin Board & Paper Co., Franklin, Ohio, has been Bowserized. As a result, the oil consumption for 276 bearings has been reduced to 3 gallons a week—a cost of 1-10 of a cent per bearing per day, with the lube oil being used costing 80c per gallon. This is accomplished automatically by a Bowser oiling system . . . If *you* desire to decrease oil consumption, and at the same time increase lubrication efficiency and reduce bearing temperature, our engineering experience is at your service.

S. F. BOWSER & COMPANY, Inc.
COMPLETE LUBRICATION EQUIPMENT
1315 Creighton Avenue
FORT WAYNE, INDIANA

When Spring Comes!

WHEN Spring comes with its freshets and high water filled with dirt and debris, will you be prepared? Will your plant continue production on an even schedule or will you have partial shut-downs due to unusable water?

High water, low water and dirty water periods hold no worries for the mills equipped with Norwood Filters, for they know that all dirt, leaves and other foreign matter will be perfectly filtered out. Only clean water enters into the making of the paper, resulting in a uniform quality. Machines are not plugged up or damaged—continuous operation is possible. Norwood Water Filters have many advantages and exclusive features.

Ask For Catalogs and Help From Norwood's Engineers.

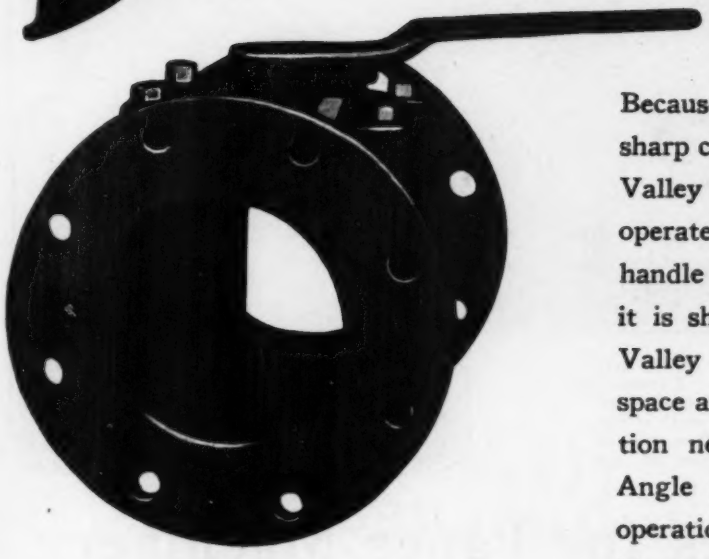
Filters
Super-Calenders
Glassine-Calenders
Platers
Dusters
Brushing Engines

and other dependable paper-mill equipment.

NORWOOD ENGINEERING CO., FLORENCE, MASS.

NORWOOD

Easier and Quicker to operate~



Valley Plug Valves are made of cast iron, equipped with a brass plug ground into position, and operate on a rotating principle. Learn more about these valves. Our special booklet on Valves will be sent you on request. Write for it today.

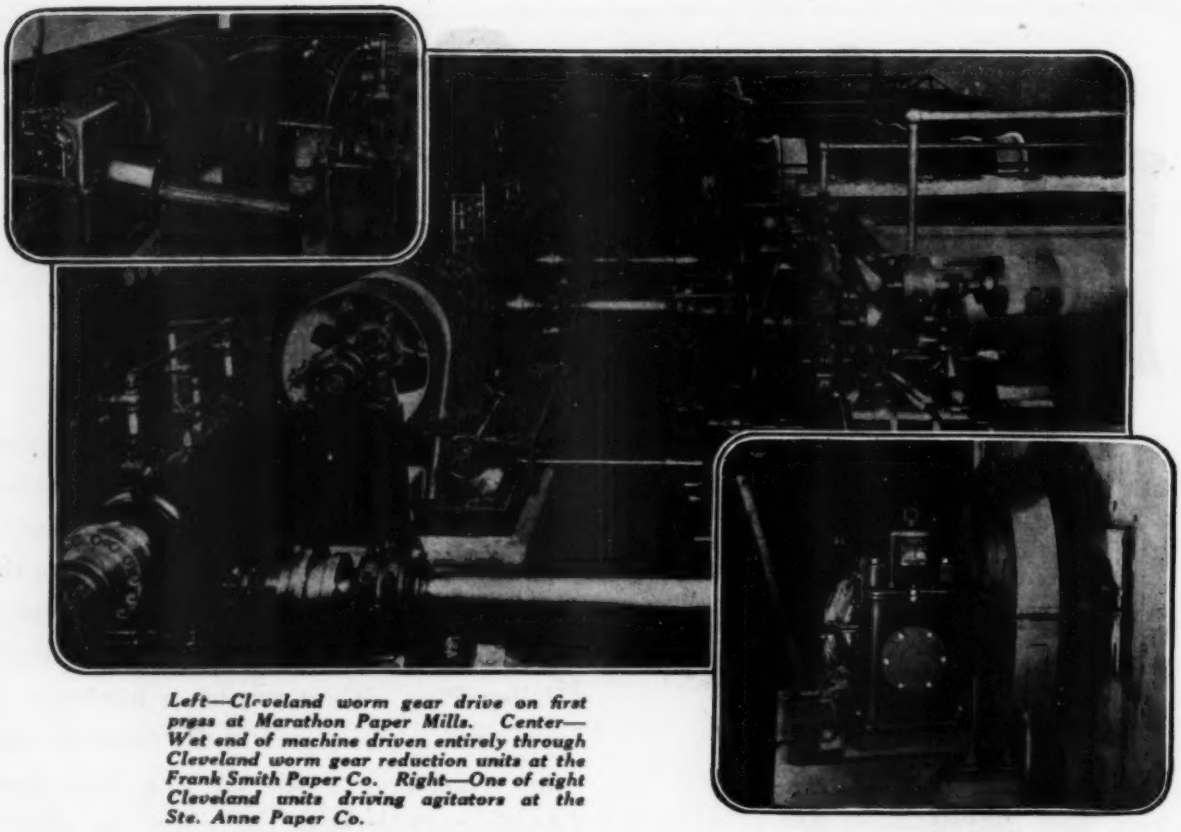
Because they are made without ledges, gates, sharp corners, springs or intricate mechanism, Valley Plug Valves are easier and quicker to operate than ordinary valves. One turn of the handle shuts or opens the valve—and when it is shut it cannot leak. It is shut tight. Valley Plug Valves require a minimum of space and can be placed in any practical position necessary to use on your pipe lines. Angle position does not affect its efficient operation. Use under unusual conditions has increased the popularity of Valley Plug Valves with paper mills everywhere. Now over 1150 are in use—testifying to the service—ability and economy of these valves. They are made to last—and once installed their economy in use is apparent. Mills that have at first installed three or four now have fifty and one hundred.

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Office: 350 Madison Avenue
Western Manufacturing & Sales Division, Smith & Valley Iron Works Co., Portland, Oregon



Left—Cleveland worm gear drive on first press at Marathon Paper Mills. Center—Wet end of machine driven entirely through Cleveland worm gear reduction units at the Frank Smith Paper Co. Right—One of eight Cleveland units driving agitators at the Ste. Anne Paper Co.

Accepted Drives for Paper Machinery

For driving the sections of paper and board machines the Cleveland worm gear unit has proven very successful. A total of thirty-seven machines are now fitted with Cleveland worm gear section drives. A complete drive with reduction unit, magnetic clutch, pulley and belt shifter, is shown above. Ask your machine builder about Cleveland gearing for section drives.

Cleveland worm gear drives are now operating various kinds of pulp and paper machinery in over one hundred American and Canadian mills. Most of these drives have been running for a period of years and all are making exceptional records for low maintenance costs and continuous operation.

The standard Cleveland worm gear reduction unit is remarkably adapted for paper mill service. The power is transmitted smoothly and efficiently; the drive is quiet, clean and compact; inherently sturdy design gives assurance of long life without breakdowns or repairs. From the wood room to the calenders, Cleveland drives are effecting real economies in power transmission.

Detailed information about the standardized Cleveland Worm Gear Reduction Units will be sent promptly on request. Ask for Bulletin 106.

Canadian Representatives
Peacock Bros., Ltd., 1605 Delorimier Ave., Montreal, P. Q.

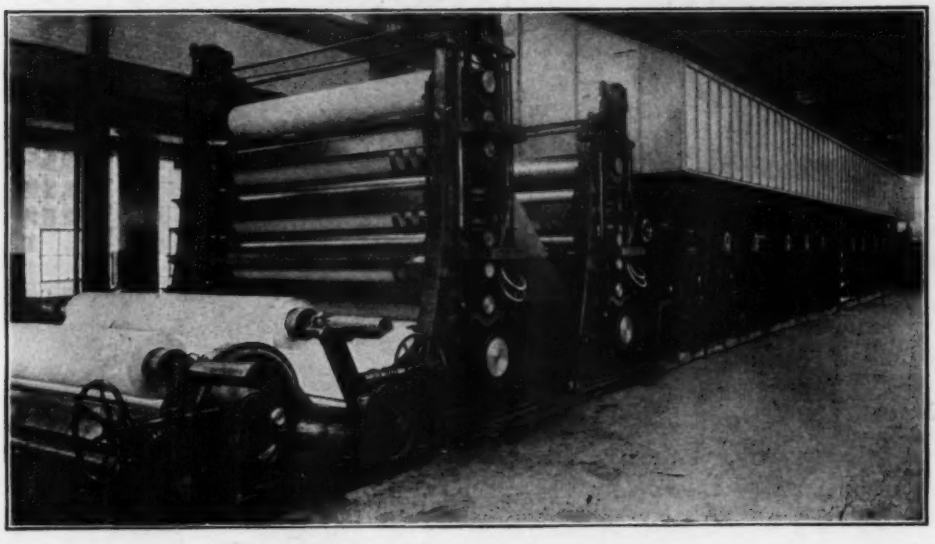
CLEVELAND
WORM & GEAR COMPANY

3270 East 80th Street **CLEVELAND, OHIO**

Nothing is apt to cost so much as a bearing that cost so little

Another one of the 36 paper machinery manufacturers that uses SKF Bearings as standard equipment.

THE PUSEY & JONES CORPORATION



Finished Product Proves Value of 300 Highest Priced Bearings in the World

FROM one end to the other, approximately 300 SKF Anti-Friction Bearings are used on this Fourdrinier machine. A complete recognition of of the ability of these bearings to successfully meet operating conditions and produce a high quality product at the lowest cost.

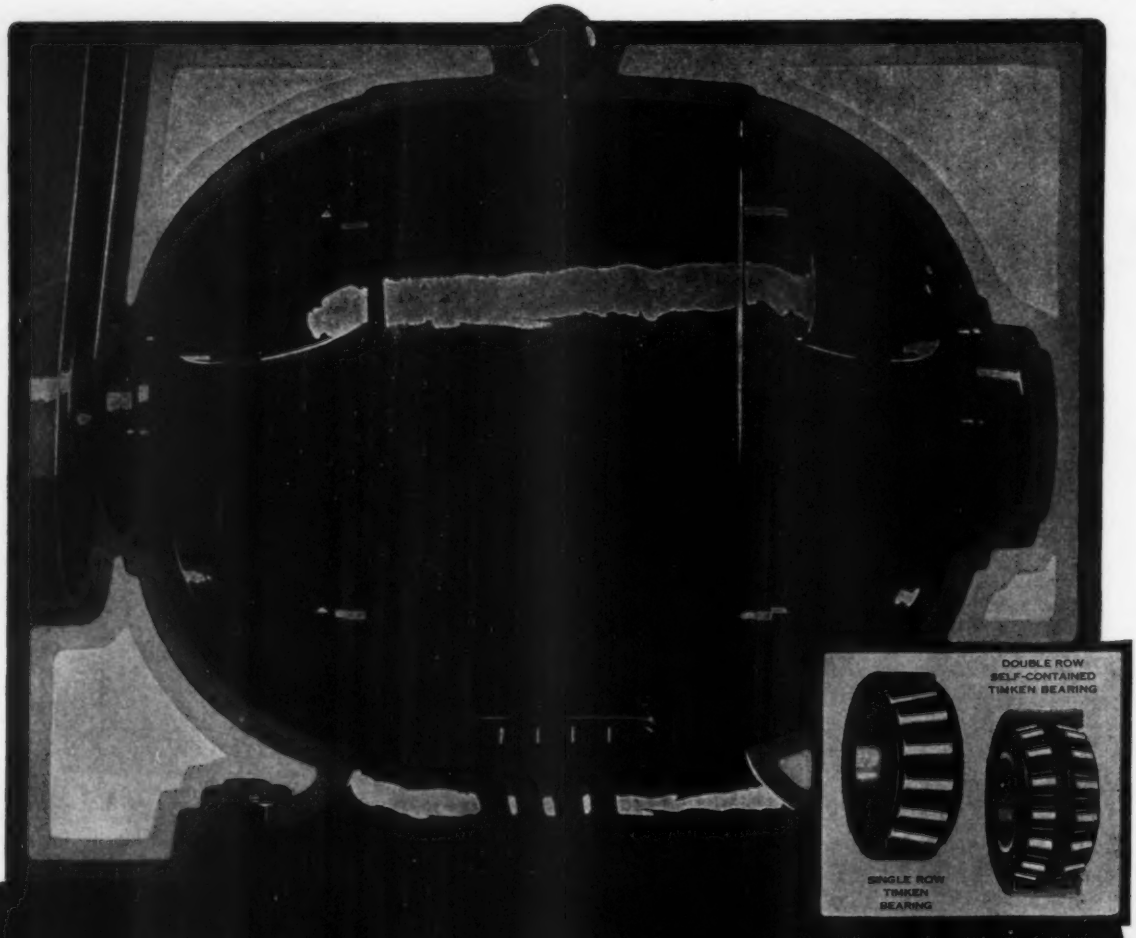
For nearly ten years the manufacturer has placed his confidence in SKF Bearings. The results to the user have justified the choice of the highest priced bearing in the world. They have a proven record of increasing life of wire, press and dryer felts. The machine runs smoothly and requires lower starting torque. Lubricant and maintenance charges are decreased and there is less danger of spoiling paper from oil or grease leakage.

You men who plan, build, use or pay for machines of any kind, remember this: It costs more to replace a poor bearing than to buy the best one that SKF ever produced. AND SKF ANTI-FRICTION BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.

SKF INDUSTRIES, INCORPORATED, 40 East 34th Street, New York, N. Y. 1968

SKF

Ball Bearings SKF Puts the Right Bearing in the Right Place **Roller Bearings**



Electric Motors for Any Hook-Up

No longer must you buy motors that fit only one job! No longer need the combination of thrust and radial load concern you. No longer do type of drive or mounting position make any difference. For the *thrust-radial* electric motor is here!

Tell the motor manufacturer merely the horse-power, the general nature of the service—and specify Timken Tapered Roller Bearings. Then the motors you get are sure to work perfectly in floor, wall or ceiling positions—on direct drive—or with flat belt, V-belt, chain, or rope—and spur, helical, or herringbone gear. It is all made possible by Timken Bearings—*the* modern electric motor bearings, with far broader functions than friction-elimination alone!

Friction-wear, thrust-wear, radial-wear, and shock-wear are overcome. The original gap is precisely maintained. Abrasion and burn-outs are eliminated. Fire-risk is minimized; more favorable insurance obtained. Starting is easier and quicker. Dripping damage is prevented by the perfect bearing closure. And lubrication cost and attention become negligible.

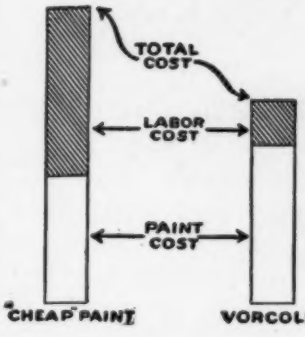
To motors, as to all types of equipment throughout all Industry, Timken Bearings bring the greatest endurance and economy ever known. The records of thousands of Timken-equipped motors, during years of service, are the proof. Capitalize these tremendous advantages for yourself, by specifying Timken Bearings in your orders for electric motors.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

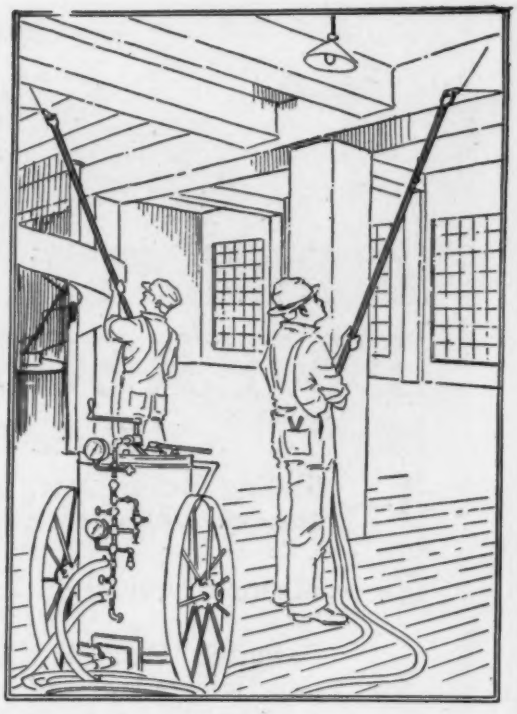
TIMKEN *Tapered Roller* **BEARINGS**

How We Make It Easy For You to use .....

The Very FINEST PAINT



By Cutting Application Costs



WE are proud of Vorcolite. Neither materials nor care have been spared in making it the very highest grade paint that money can buy. Certain exclusive properties put it in a class by itself for large area work with light diffusion as the object.

We believe in fine paint for the industrial user and never knew any good to come from compromising in the matter of paint quality.

But we have done more than offer you a remarkable paint at a fair price. By tackling the *whole problem*, instead of a part of it, we have made Vorcolite the most economical paint to use as well as the finest.

Paint Cost Vs. Painting Cost

The ordinary painting job costs about 40 percent for paint and perhaps 60 percent for application. Close buyers sometimes think they can save by whittling away at the cost of the paint, where every cent of reduction is apt to mean the sacrifice of much needed paint quality.

The Vortex way is to shoot at the bigger mark—application. By perfecting a painting equipment especially for large area work, we are able to increase speed of painting over ordinary paint guns almost as much as these paint guns exceed brush painting.

Instead of 60 percent of the expenditure going into labor cost, the Vortex proportion is 10 percent or less.

We Loan Painting Equipment

When you paint with Vorcolite, we send you as many Vortex equipments as are necessary to do the job expeditiously and well. Your own "handy man" labor can work this equipment by following simple directions.

This saves all investment in paint equipment and gives you a better outfit for this purpose, than money can buy. No cleaning of paint hose, no replacement of parts. We attend to that when you ship it back.

You sign no contract, you are "tied" to nothing. Each job stands on its own merits.

Money in Paint?—or Labor?

Where do you want to invest your money?—in quality paint or expensive application?

All that labor can possibly do is to get the paint where it belongs. This the Vortex labor saving equipment does, supremely well.

After the labor is expended, the paint stays with you for better or worse—in case of Vorcolite, for better.

A single application of Vorcolite covers like two or three brush coats. Its heavy, richly pigmented paint body reflects and diffuses light. Its firm surface is cleaned with ease. It lasts when cheaper paints have yellowed or disintegrated.

With 90 cents of your dollar in paint and only 10 cents in application, you will need decidedly fewer dollars than when 40 cents goes into paint and 60 cents in labor.

The coupon at the right is your first aid toward Vorcoliting your own premises.

The Vortex Manufacturing Co.
1981 West 77th Street *Cleveland, Ohio*

The Vortex Painting Method

Paint—Vorcolite flat white, famed for light diffusion, easy cleaning, long service and efficient coverage in a single application.

Equipment—A better large area equipment than you can buy, without a cent of investment.

Labor—Your own "handy man" does a fine job with Vortex Equipment.

References—Hundreds of America's largest industrial concerns who have standardized on Vortex Painting.

Use the coupon below to secure a dependable estimate of the cost of Vorcoliting your own factory.

THE VORTEX MFG. COMPANY
1981 West 77th St. - Cleveland, Ohio
Please give us your best estimate of the cost of covering sq. ft. with Vorcolite. Surfaces are

.....

.....

Name .....

Address .....

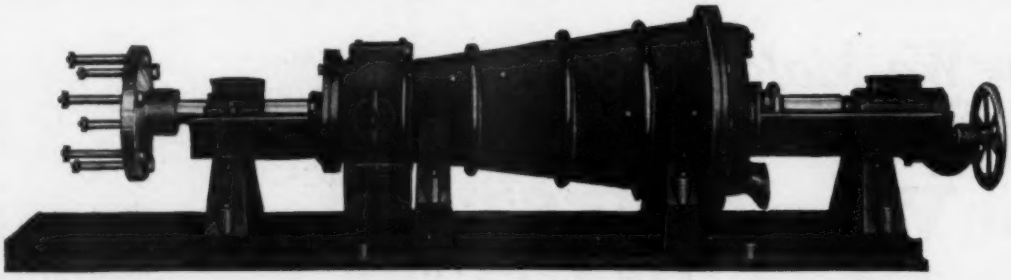
.....

Attention .....

V-43

FLAT WHITE
Vorcolite
and the VORTEX PAINTING METHOD

V-43



EMERSON REFINERS

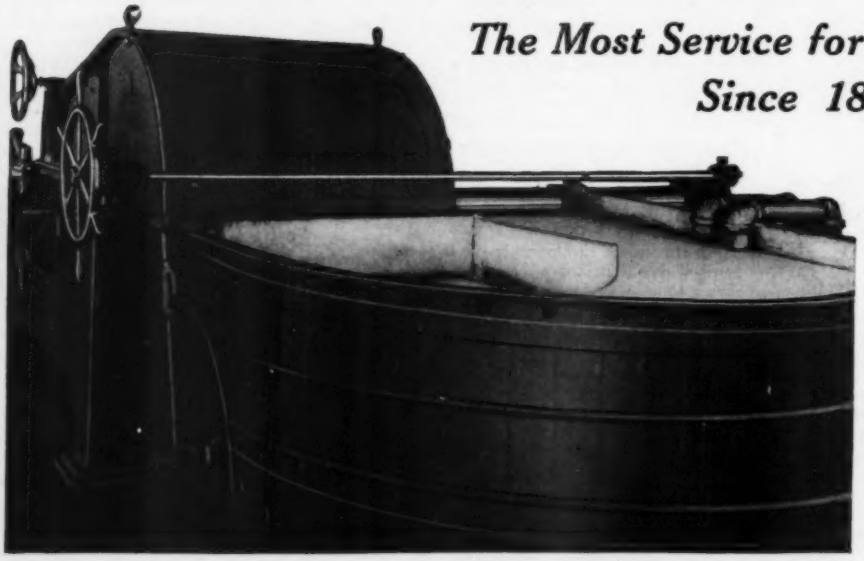
Some Special Features

1— Sliding Brass Gate, permitting removal of all foreign substances while refiner continues in operation.

2— Means of quickly maintaining alignment of plug and shell.

3— Patented Flexible Coupling allows endwise movement of plug without changing position of motor. Alignment of plug shaft with motor shaft not necessary.

EMERSONS ARE BUILT TO DO YOUR WORK



The Most Service for the Least Cost
Since 1888

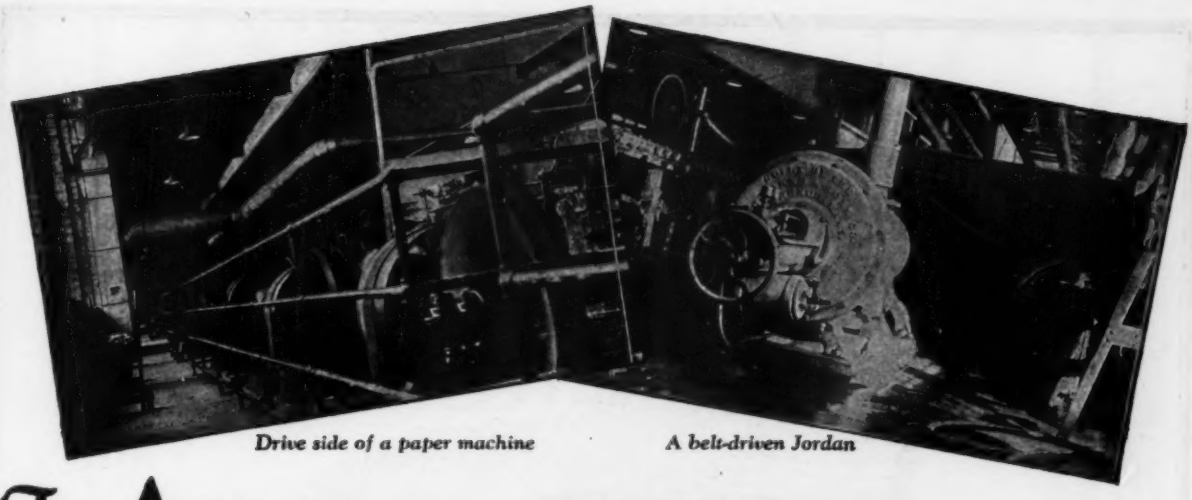
Emerson Beaters

Used in connection with Emerson Refiners, results in perfect "team work" all through this most important stage of paper production. Emerson Beaters are built to care for your specific requirements.

When you have a roll or plug to build, get in touch with Emerson first for prompt quotation and quick service.

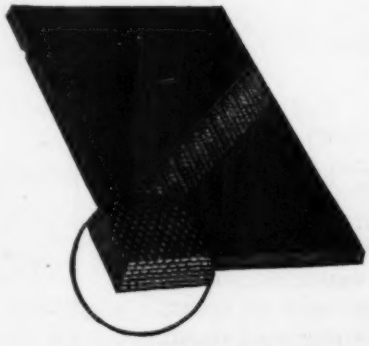
When You Need a Roll or Plug Let Emerson Quote You

EMERSON MFG. COMPANY, LAWRENCE, MASS.



Drive side of a paper machine *A belt-driven Jordan*

For ALL Paper Mill Drives *The* Belt is "1788 Highflex"!



Send for bulletin 9700: a manual for paper makers on paper mill rolls.

COMBINING maximum strength with minimum thickness, "1788 Highflex" will carry loads over relatively small pulleys.

The friction rubber in this wonderful belt has all the "nerve" and snap of the finest plantation rubber, combined with certain ingredients which enable it to retain this life and elasticity in spite of age and heat. Its elastic quality gives extreme flexibility and pulley-grip.

All excess stretch is removed in manufacture, thus preventing frequent take-ups. The compact, dense weave of the duck gives a strong anchorage for hooks and lacings.

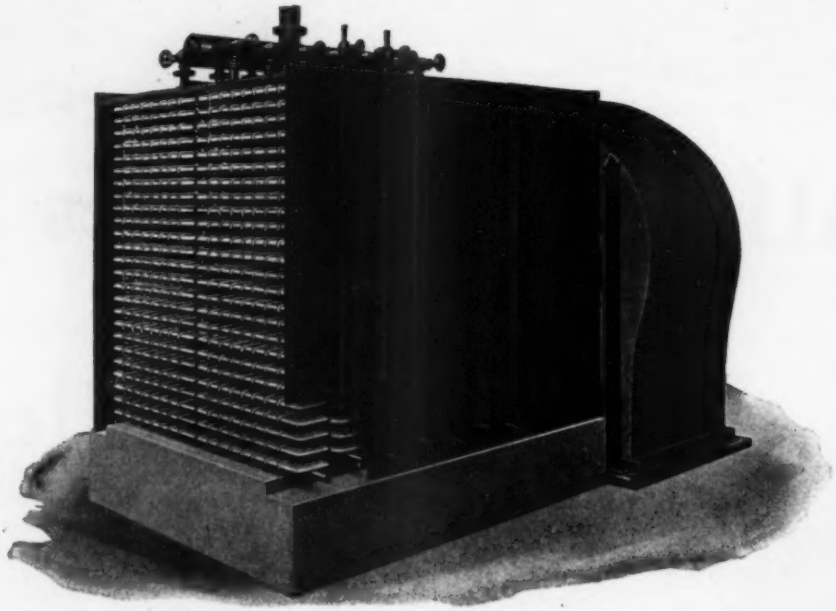
There are no seams on either side. The Foldless Edge prevents bootlegging; insures great flexibility, perfectly straight running and uniform strength.

Try "1788 Highflex" on your hardest drives!

THE B. F. GOODRICH RUBBER COMPANY
Established 1870 Akron, Ohio

Goodrich
"1788 Highflex" Belt

Stickle Blast Coil Heater or Economizer Will Dry Your Felts With Hot Air



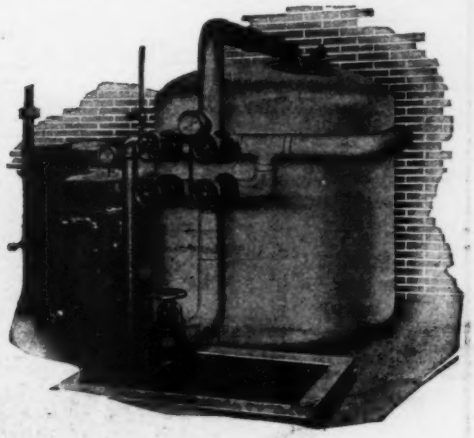
STICKLE air cooled condenser maintains a vacuum of 10 to 15 inches on the return line of your paper machine, returns condensate to the boiler room as hot as it can be handled with a pump without the admission of cooling water. Will heat 1000 cubic feet of air per minute for every ton of paper dried per day, furnishing hot air in the pit to dry the felts and absorb the vapor under the dryers, making a direct saving of at least 15 per cent in steam consumed for drying the paper and ventilating the machine room. This can be done at a moderate cost. Are you interested? Complete plans furnished without charge.

Stickle Steam Specialties Co.
INDIANAPOLIS, IND.

AUTOMATIC STEAM CONTROLS
BLOWING THROUGH DRAINAGE SYSTEMS
COMPLETE LINE STEAM SPECIALTIES

HOW MUCH

is oil free condensate worth to you——?



Permutit Oil Removing Filters are made in all sizes to fit any Boiler Plant.

Oily condensate is a costly thing to have around any boiler plant. If you use it in your boilers you have frequent cleaning bills and tube replacements to pay for besides wasting considerable quantities of fuel due to the insulating effect of the oil on your boiler tubes.

On the other hand, if you throw it away you lose heat that is equivalent to many tons of coal. If a 1,000 b.h.p. plant, for example, should throw away 75% condensate it would lose 78,000,000 B.t.u. every 24 hours or the equivalent of 5 tons of coal per day.

The only economical thing to do therefore, is to remove the oil, and that is what Permutit Oil Removing Filters do, inexpensively and completely. These filters are guaranteed to take all oil out of water whether it is in suspension or emulsion. They are compact and simple to operate. The filtering medium never has to be removed or renewed. And they will deliver oil-free water at a cost under 1 cent per 1,000 gallons. They invariably save their own cost in a few months' time.

It will pay you to read our interesting booklet "Saving Fuel and Repairs with Oil Free Feed Water." There is no obligation, send for it today.

Read What Others Say

Kalamazoo, Mich.
We are very satisfied with the performance of this equipment and have had no operating difficulties.

Whippany, N. J.
—The boilers were entirely free from oil at a recent inspection of the Hartford Steam Boiler Insurance Company.

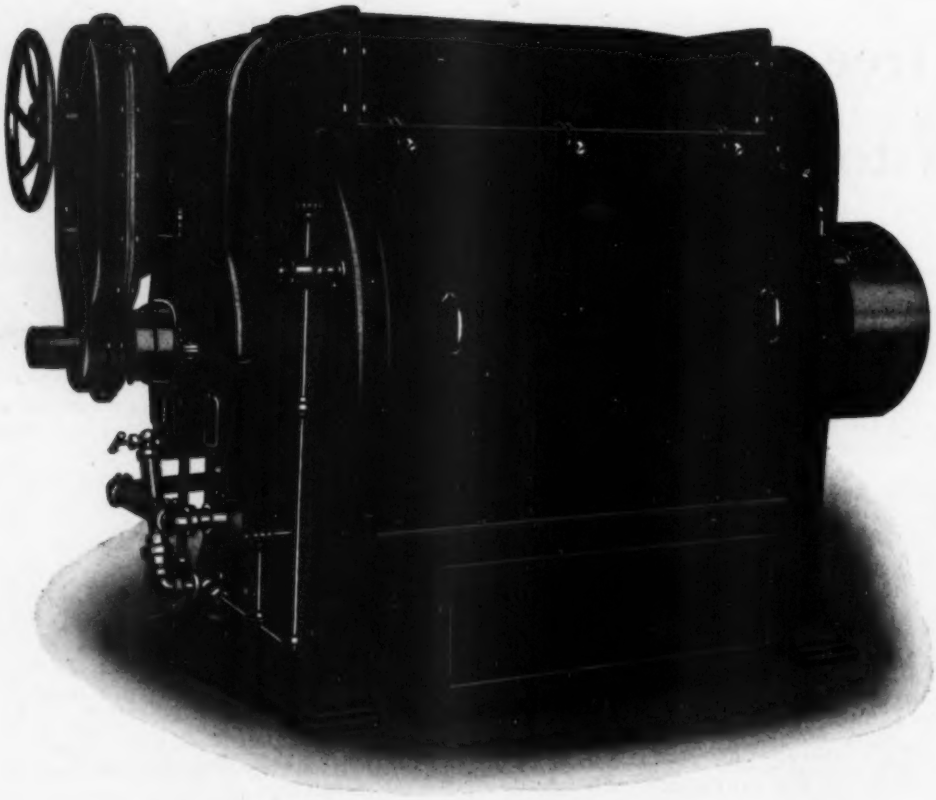
Minneapolis, Minn.
—The boiler inspector who inspected our boilers reports that they are free from oil and are the cleanest boilers he has to inspect.

The Permutit Company

APPARATUS FOR REMOVING IMPURITIES FROM WATER

REED-SPAFFORD PULP SCREEN

(Built in two sizes)



The REED-SPAFFORD PULP SCREEN is remarkably efficient. Its capacity is large and its power consumption is surprisingly low. Let us show you what a saving this screen means to you.

Our Paper and Pulp Machinery is CONSTANTLY IMPROVED

Improved Paper Machinery Co.

Nashua, N. H., U. S. A.

SHERBROOKE MACHINERY CO., Limited

Sherbrooke, Quebec, Canada

Is Your Mill Here?—

Aetna Paper Mill Corp.
Algonquin Paper Corp.
Allied Paper Mills
American Can Co.
American Writing Paper Co., Inc.

Bagasse Products Corp.
D. M. Bare Paper Co.
Bryant Paper Co.

Central Paper Co.
Chillicothe Paper Co.
Consolidated Paper Co.
Consolidated Water Power & Paper Co.

Dells Paper & Pulp Co.
DePere Paper Mfg. Co.
Detroit Sulphite Pulp & Paper Co.
Donnacona Paper Co.
Dunn Sulphite Paper Co.

Eddy Paper Corp.
Escanaba Paper Co.

Falls Mfg. Co.
Filer Fibre Co.
Flambeau Paper Co.
Fletcher Paper Co.

Hawthorne Paper Co.
Hoberg Paper & Fibre Co.
Hopper Paper Co.

International Paper Co.

Kalamazoo Paper Co.
Kalamazoo Vegetable Parchment Co.
Kaydeross Paper Co.
Kimberly-Clark Co.
Knowlton Bros.

Lafayette Box Board & Paper Co.
Lake Superior Paper Co.
Lawless Bros. Paper Mills, Inc.
Lee Paper Co.
Little Falls Paper Co., Inc.
Lowe Paper Co.

Mac-Sim-Bar Paper Co.
Marinette & Menominee Paper Co.
Mead Pulp & Paper Co.
Menasha Paper Mills Co.
Michigan Paper Co. of Plainwell
Minnesota & Ontario Paper Co.
Monroe Paper Co.
Monroe Paper Products Co.
Munising Paper Co.

Nekoosa-Edwards Paper Co., Inc.
North Star Straw Board Mills
Northern Paper Mills

Oswego Falls Corp.

Parker-Young Co.
Peshtigo Paper Co.
Piqua Straw Board Co.
Port Alfred Pulp & Paper Corp.
Port Huron Sulphite & Paper Co.

Rex Paper Co.
Rhinelander Paper Co.
Rochester Paper Co.

St. Maurice Valley Corp.
St. Regis Paper Co.
Saranac Pulp & Paper Co.
Simplex Paper Corp.
Spanish River Pulp & Paper Mills Ltd.
Standard Paper Co.
Sutherland Paper Co.
Sweet Bros. Paper Mfg. Co., Inc.

Union Bag & Paper Corp.

Victory Bag & Paper Co.

Watab Paper Co.
Watervliet Paper Co.
Wausau Paper Mills Co.
Western Board & Paper Co.

These mills, and others, are users of

Acid Tanks	Stuff Chests
Agitators	Wood Stave Pipe
Vomit Stacks	Beater Chests
Blow Pits	False Bottoms
Flow Boxes	Glazed Tile Tanks

and other wood tanks and vats of every description, made by specialists in paper mill tank equipment—the

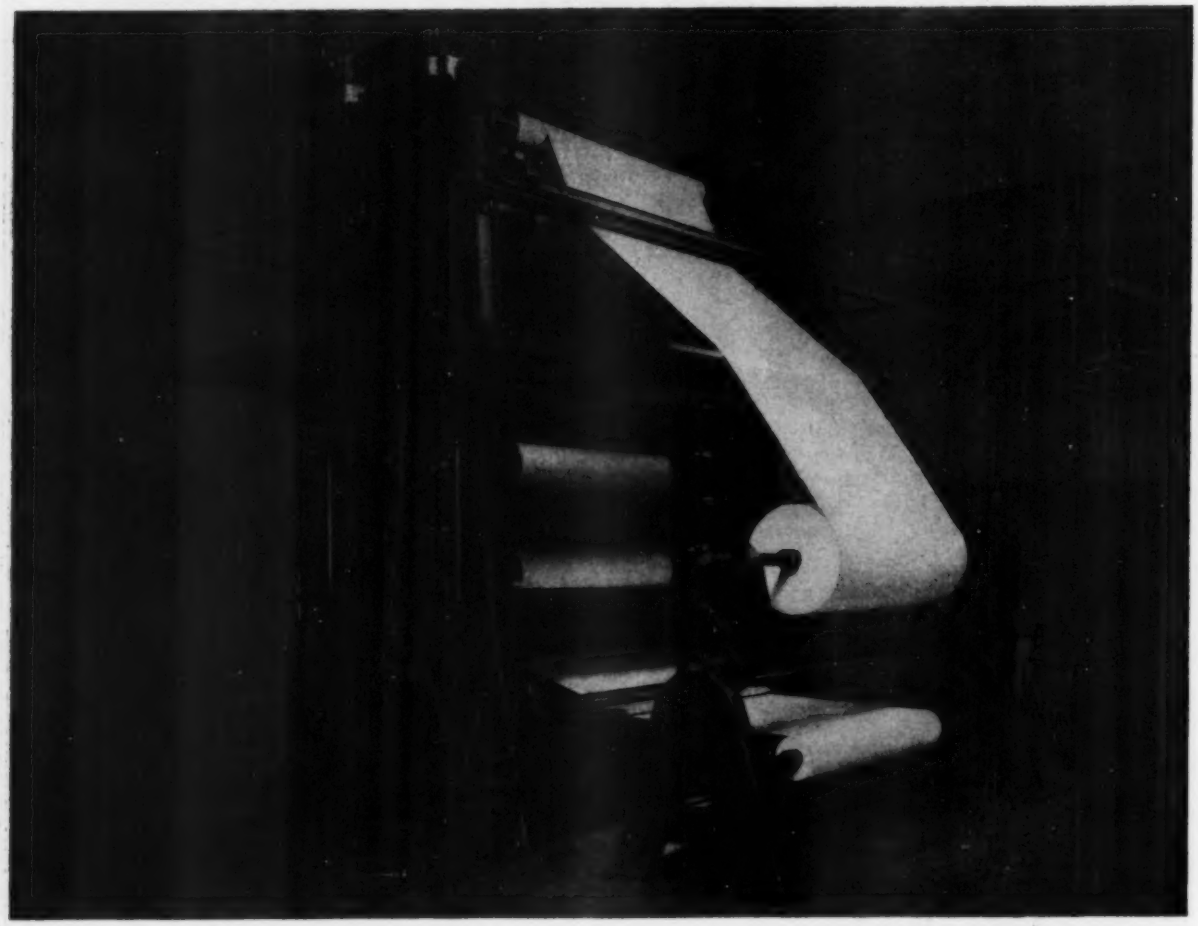
KALAMAZOO TANK & SILO CO.

of

KALAMAZOO, MICHIGAN

WHY NOT CALL IN A SPECIALIST?

"NO CALENDER CAN BE BETTER THAN THE ROLLS IN IT"



Perkins 9-Roll Web Super-Calender

The importance of rugged strength in a stack is appreciated by everyone having to do with calendering

Photograph of this Perkins 9-Roll Web Super-Calender, taken in a Pennsylvania mill, gives an indication of the weight and the strength that the Perkins engineers have built into this machine. It is made to stand up and run steadily under the most severe operating speeds and conditions. In action it is a highly efficient production unit, easy of operation and low in power consumption.

This calender which is typical of the Perkins complete line of finishing machinery is living up to the Perkins standard—finishing paper in the ***most satisfactory way it can be done.***

In every detail it is built in full accord with Perkins Rolls whose leadership for half a century has been so generally recognized.

B. F. Perkins & Son, Inc., Holyoke, Mass.

COTTON ROLLS
PAPER ROLLS
EMBOSSING ROLLS
CHILLED IRON ROLLS
GRANITE PRESS ROLLS
WEB SUPERCALENDERS
GLASSINE SUPERCALENDERS
FRICTION CALENDERS

TRADE MARK REG. U.S. PAT. OFF.

EMBOSSING CALENDERS
SHEET CALENDERS
PLATERS
MULLEN PAPER TESTERS
TENSILE TESTERS
VENTILATING FANS
RAG CUTTERS
STOCK CUTTERS
PAPER DAMPENERS
BLEACH EJECTORS

"Built to a standard of millions of operations"

One size handles a wide range of motor ratings

C-H "X"

"Across-the-line" starters

Offer new possibilities in standardization economy

ONE STARTER serves a wide range of motor sizes which permits standardization of control equipment. To adapt C-H "X" Starters to motors of different ratings, it is merely necessary to select the proper heating coil for the horsepower size required.

Think of the savings in time, cost and trouble that this interchangeable feature offers. A few starters carried in stock, a complete range of heater coils on hand and you are in a position quickly to add efficient Motor Control to new equipment or make replacements.

You will find in C-H Starters other features—features that make possible the C-H standard of "million of operations"—to which these starters are built.

After you have examined the details of C-H "X" Starters, you can't fail to see the big advantage of using them in your plant. Write for complete details.

10 *Exclusive Features*

1. *Thermal Overload Protection.*
2. *Adjustable overload release insuring maximum motor output.*
3. *Reset for overload release on cover.*
4. *Double pull solenoid type magnet.*
5. *Magnet coils easily interchanged to alter rating.*
6. *Hardened and ground steel bearings for switch mechanism.*
7. *Entire switch assembly easily removed.*
8. *Contacts easily removed.*
9. *Chimney type arc shields and heavy blow out coils.*
10. *Case and mechanism designed to provide easy access to all parts.*

The CUTLER-HAMMER Mfg. Co.

Pioneer Manufacturers of Electric Control Apparatus

1272 St. Paul Avenue MILWAUKEE, WISCONSIN

CUTLER C-H HAMMER

Industrial Efficiency Depends on Electrical Control

Four years ..... before the Civil War

THAT'S a long time ago. Few men alive remember those days. Yet, even then Shuler and Benninghofen were making Hamilton Felts.

Seventy years of experience are woven into every paper making felt that leaves our mills. It is the one asset, more than all the others, that makes a Hamilton a better felt.

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

This experience which dictates the choice of the wools and the proper mixing of them, the method of combing and carding, of weaving and of fulling, assures felts with all the qualities you want—long life, economical cost, large water removing qualities, and good production of good paper.

The result is that with a Hamilton Felt on your machines you make paper at a lower cost. You remove more water and save in steam and coal. You get longer life and put up with less down time for washing. You produce a better and more uniform sheet with less broke. In other words, a Hamilton Felt makes money for you.

Try a single Hamilton Felt. Put it to any test you think a felt ought to undergo. Compare it with the results you have been getting. Then you will use Hamilton Felts on all your machines.

The Hamilton Felt man who calls on you can give you a Hamilton Felt which will fit your machines, stocks, and mill conditions perfectly. Ask him, or write to us direct.

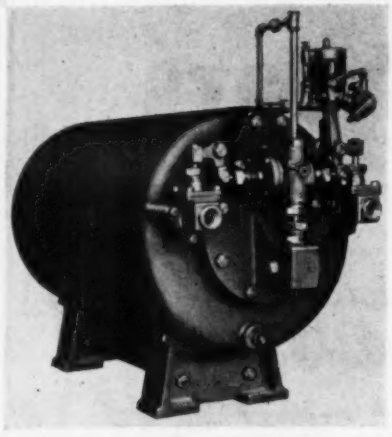
Shuler and Benninghofen, Hamilton, Ohio

The Miami Woolen Mills

ESTABLISHED 1858

Hamilton *Felts*

The Most Recent Development for



Nothing inside but the float

Pumping high and low temperature fluids such as Oil, Condensates, Acids, Gasoline, etc.

Draining Condensers, Dry Kilns, Blast Coils, Vacuum Pans, Water Heaters, Receivers, Paper Machine Dryers etc.

Feeding Boilers

The SHORTT AUTOMATIC PUMPING TRAP

Introduces a radical improvement in pumping trap operation. Receiver is stationary and pressure and vent valves are piston operated. Result —quicker action, more positive operation, elimination of trunions, bumpers, dash pots, balance weights and all adjustments. Works equally well on steam or air. Shipped ready for easy connection. Fully guaranteed.

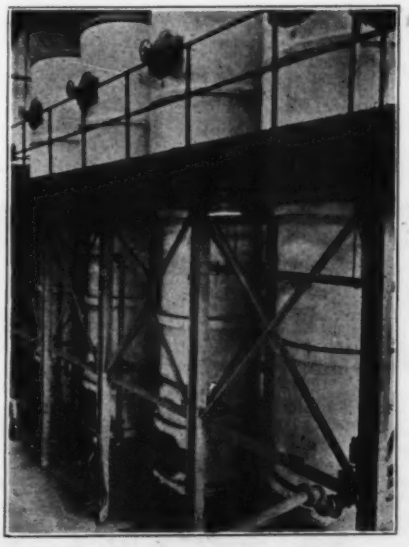
Write for Descriptive Bulletin—Today

Other Products of The W. B. Connor Co., Inc.
ACE Steam Traps (non-return type)
ACE Air Filters
DuBus Pumps for all viscous liquids, positive-acting, self-priming.

The W. B. Connor Co. Inc.
365A Lexington Ave., New York, N. Y.

IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
NORTHWEST PAPER CO.
Cloquet, Minn.



NON-FOAMING

MAXIMUM STEAM ECONOMY

NO ENTRAINMENT

SODA and SULPHATE PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1928 Paper and Pulp Mill Catalogue

Over Fifty Years

Experience in the manufacturing of wires for American and Foreign paper makers and the ever increasing use of Appleton Wires testify to their quality.

Looms of our own design, wire drawn in our own plant to specifications derived from exhaustive research, and carefully trained operators make this high quality possible.

Appleton Wires

are good wires

APPLETON WIRE WORKS INC., APPLETON, WIS.

KENWOOD
WOOL PRODUCTS
REG. U. S. PAT. OFF.

Satisfactory Felt Performance is ALWAYS the result of basically sound DESIGN—

For after all, a Felt must satisfactorily meet the constantly changing conditions in day-after-day running—

It must be built to meet, not only ONE condition, but ALL conditions, and it must afford a margin of safety in STRENGTH, OPENNESS and FINISH.

These qualities can be secured ONLY through fundamentally sound principles of DESIGN.

Such Felts have been developed through KENWOOD RESEARCH

and afford, not only continued High Production as a result of design, but also the added advantages of the Kenwood Patented TANNING Processes.

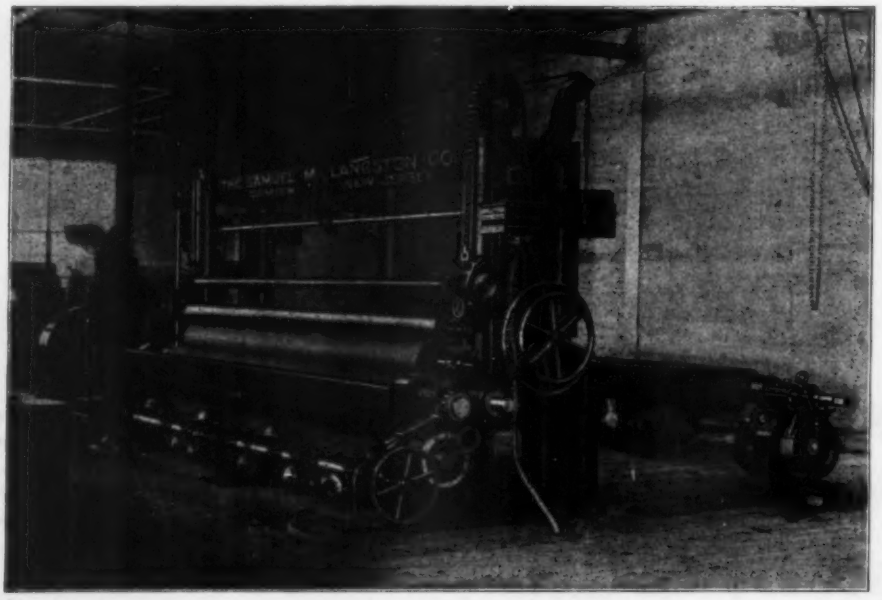
Reports received from all parts of the country would indicate tremendous advantages in all classes of Mills from the use of

KENWOOD TANNED FELTS

F. C. HUYCK & SONS

KENWOOD MILLS
ALBANY, N. Y.

KENWOOD MILLS LTD.
ARNPRIOR, ONTARIO



WHY

you can make better rolls on the Langston

ROLLS of just the desired degree of tightness, of uniform density, easy to separate, *dustless.*

The making of rolls that meet these specifications presents no special difficulty in mills that use Langston Slitters. Here are some of the reasons:

Take the matter of tension. With the Langston winding principle it is a simple matter to produce rolls of exactly the required tightness. You can wind rolls that are tight, starting with the first wrap of the paper around the rewinding shaft, and the tension can be maintained evenly right up to the maximum diameter. This means uniform density.

Rolls made on a Langston are free from dust. The Langston Shear Cut produces the same character of cut as that made by a pair of shears, without dust or lint.

Further, the Langston Shear Cut principle means that every roll is cut all the way through. The cut is continuous every inch of the way, clean through the paper from the outside to the center of the roll. No occasional breaks in the cut which cause grief when it comes to separating the rolls, if not actual damage.

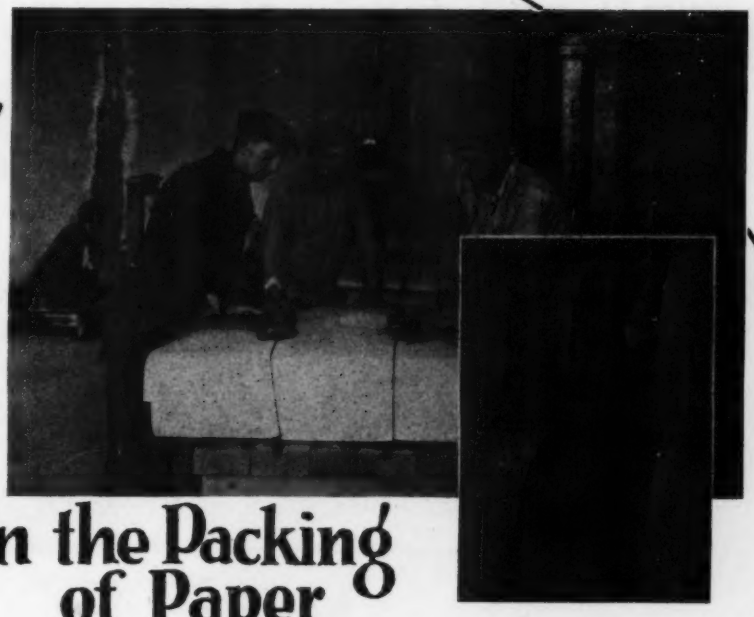
The more exacting the requirements your rolls must fulfill, the more you need a Langston.

SAMUEL M. LANGSTON COMPANY, Camden, New Jersey

CLEAN SHEAR CUT CUT

LANGSTON SLITTERS

Consider these Savings!



In the Packing of Paper

By shipping flat paper stock on skids bound by the Gerrard Method you save $7.50 per ton, make loading and unloading easy and eliminate damage.

If you must ship flat stock in cases, insure the safe arrival of that package—protect it from damage and eliminate claims and customer complaints by using Gerrard Round Bands of steel at a 25 to 50 per cent saving over your present costs.

The Gerrard Method of binding a carload of roll paper into two units, one in each end of a car, for absorbing the shocks of train movement, saves $3.00 to $5.00 per car over old wood bracing methods, eliminates damage and makes loading and unloading easy.

In preference to twine or other substitutes, many paper mills are using the Gerrard Method for paper bundles or bales at savings as high as 60 per cent over old methods.

These advantages—these savings that often mount up to thousands of dollars—are yours for a nominal investment. Return the coupon for verification of these facts.

THE GERRARD CO., INC.,
1939 S. 52nd Ave.,
Chicago, Ill.

I am interested, through the use of the Gerrard Method, in the savings that you can effect on

- ☐ Roll Paper
- ☐ Cases
- ☐ Skid Paper
- ☐ Bundles

At no obligation to me please have representative call.

Name .....

Address .....

GERRARD

WHAT PRICE PER TON?

WHAT DOES IT COST PER TON IN YOUR BEATER ROOM?

One of the four 66"x60" New Type Beaters installed at the Tumwater Paper Mills Company

A certain mill in the middle west has effected beater power saving of 31.7% per ton of stock after installing Dilts NEW TYPE Beating Engines.

Other mills using Dilts NEW TYPE Beaters show similar good results.

How can *you* meet competition against those mills if you continue to operate with your old beater equipment? Your cost per ton will be too high.

In the year just ended, the sales of Dilts Beating Engines increased 117% over the previous year.

There is no question about the superiority of the Dilts NEW TYPE Beating Engines, and the progressive mills are rapidly installing them.

You should fall in line. "Your paper is made in your beaters." You are vitally interested in reducing your cost per ton.

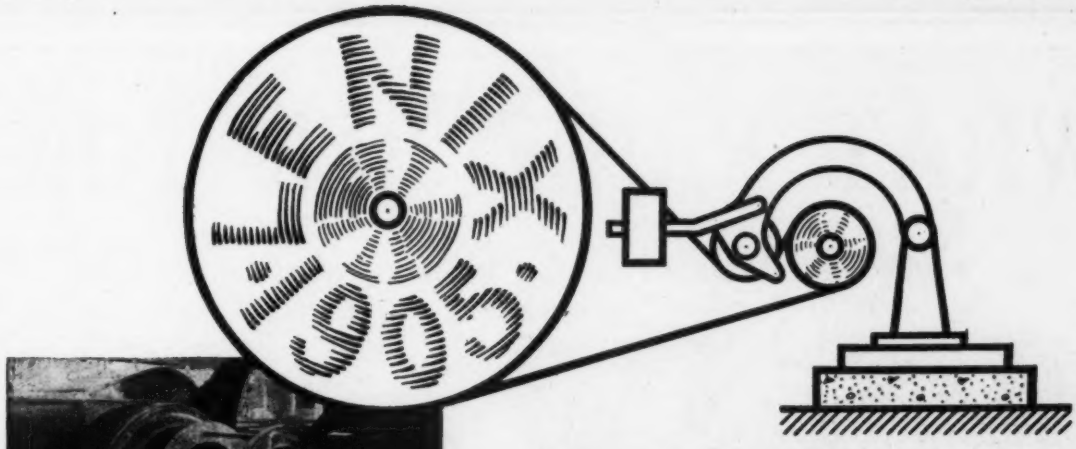
Among 1927 sales are NEW TYPE beater equipments to the following mills:

The Southern International Paper Co., Backus-Brooks Company, Lincoln Pulp & Paper, Ltd., Tumwater Paper Mills Company, St. Regis Paper Company, West Jersey Paper Manufacturing Company, Howard Smith Paper Mills, Ltd., Grays Harbor Pulp & Paper Company, U. S. Rubber Company, Southern Advance Bag & Paper Company, E. B. Eddy Company, Ltd., National Paper Products Company, Provincial Paper Mills, Ltd., Consolidated Paper Company, United Paperboard Corporation, International Fibre Board Company, Ltd.

Dilts

MACHINE WORKS, Inc. FULTON, N.Y.

EXPORT OFFICE - 15 PARK ROW - NEW YORK CITY



Double headed motor driving two beaters and equipped with LENIX Drives

Belt Drives At Their Best

Two distinct phases are involved in any belt driven machine. These are installation and operating.

A good belt drive installation usually calls for—

pulley centers as short as practical
greatest arc of belt contact on pulleys
use of less expensive, high speed motors
saving in initial belting
conserving of floor space

Efficient operation calls for:

avoidance of belt slippage and flapping
constant and accurately maintained belt tension
ability to compensate for varying loads
minimizing of bearing lubrication and maintenance
longer belt life.

All these benefits can be had by installing the LENIX Short Center Belt Drive on the equipment in question. It can be installed on existing drives or with new ones.

The LENIX makes belt drives do their best. And when belt drives do their best, they are just about the ideal non-positive drive.

Write for our recommendations for your drives—existing or proposed.

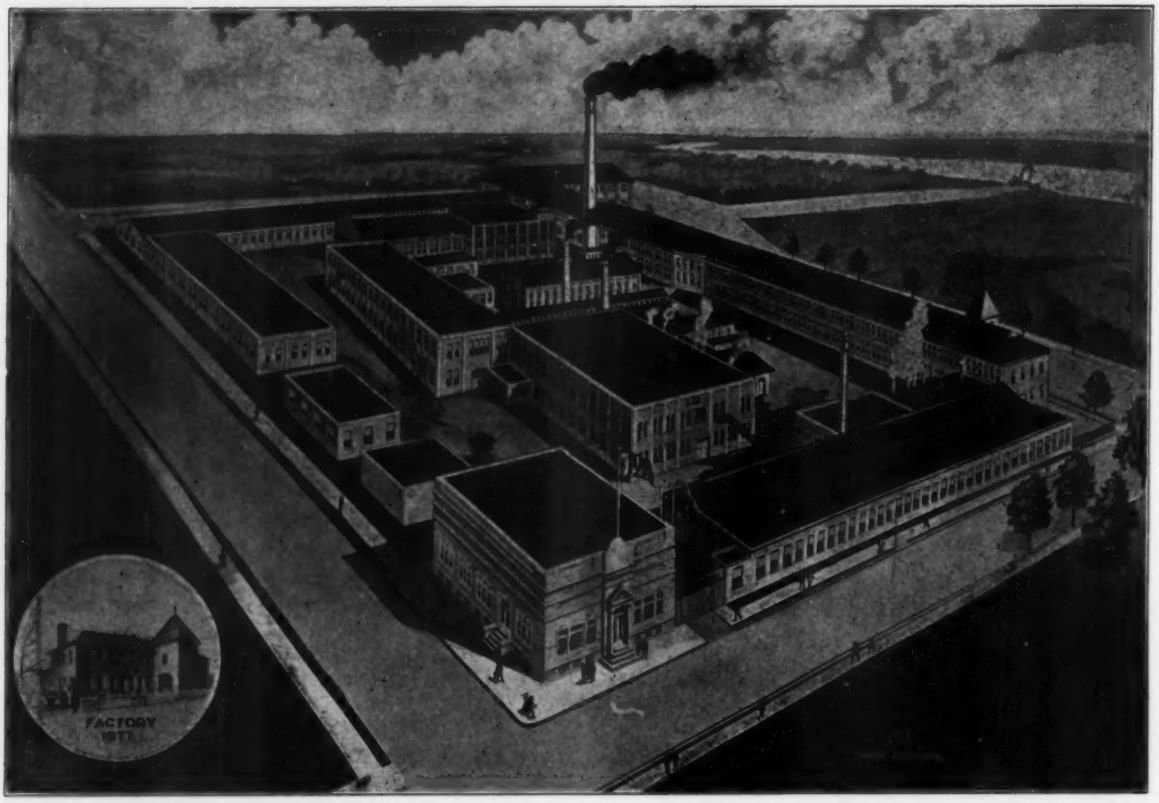
F. L. SMIDTH & COMPANY
Incorporated 1895
Engineers
54 Church St., New York, N. Y.

The Idea Back of The LENIX

Just as the belt for any drive is selected to take care of a definitely determined transmission problem, the LENIX is also selected to do a certain definite job. The LENIX is not a belt idler. It is something entirely different. The LENIX is selected and installed according to engineering formulae based on each set of specific conditions involved. That is why the LENIX is known for its ability to, "get the most out of a belt drive."

The LENIX *Drive*

Reg. U. S. Pat. Off.



This illustration Visualizes Fifty-one Years of Progressive Growth
and Unsurpassed Achievements in the Production of

EASTWOOD

FOURDRINIER-CYLINDER-WASHER

WIRES

EASTWOOD WIRE MANUFACTURING CO., BELLEVILLE N.J. U.S.A.

BROUGHTON SYSTEMS

Enables large paper machines to start up and operate on full drying capacity in 30 minutes or less.

HEALY-RUFF COMPANY
ST. PAUL, MINN.

De Laval Worm Gears
Superior Speed Reducers
These eight 3 5/9 ratio gears receive power from a line shaft through variable speed cone pulleys and drive the several sections of a paper machine. Each gear is connected to driving and driven shafts by De Laval Flexible Couplings. Ask for Catalog R.
for Cramped Locations
De Laval Steam Turbine Co., Trenton, N. J.

The Chicago Belting News FINAL EDITION

for PAPER MILLS

Written for Paper and Pulp Mill Men
by the Chicago Belting Company, 100 N. Green St., Chicago

VOLUME I Not Copyrighted MARCH, 1928 *This paper consists of 1 page* Price—3 Minutes

THE SWING TO LEATHER BELTS ON BEATERS

A great belt for a great drive

IN THIS age of specialization plant operators and machine designers have recognized a need for a special belting for idler and multi-pulley drives. Sea Lion Retan was developed by the engineers, tanning experts and leather chemists of the Chicago Belting Company to meet this demand.

Sea Lion Retan—for the first time in the history of leather belting manufacture—combines *the dependability and enduring long life of the best oak tanned leather belting with the pliability and heat resisting quality of the best chrome or mineral tanned belts.*

Sea Lion Retan TRADE MARK CHICAGO BELTING COMPANY

This new and remarkable tannage—together with special construction features—make Sea Lion Retan work better on flexible idler drives than any other belting. These belts are not only pliable but also are made with *special calipered laps* so that the belts flow smoothly over the pulleys *without bumping or pounding.*

Waterproof—Oilproof—Heatproof

Sea Lion Retan belts are waterproof, heatproof and oilproof to a high degree. They are made with our famous Sea Lion waterproof cement and the laps and cemented parts are guaranteed not to open up or come apart. They are made by the pre-tested method of construction of the Chicago Belting Company with special currying and workmanship. The laps are the same thickness as the rest of the belt.

Short center drives with Sea Lion Retan Belts

SHORT center, balanced idler drives with Sea Lion Retan leather belts are the most dependable, efficient drives for beaters, paper machine drives or any other paper mill drive.

They permit the use of higher speed motors and short belt lengths and frequently your motor savings almost pay for the installations.

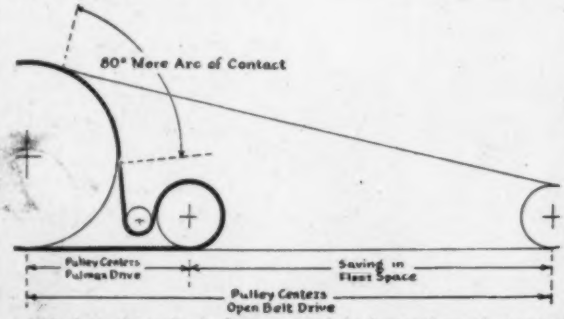
They operate in any pulley position and on vertical as well as horizontal drives. They drive with idler on either side and with any pulley ratios up to 12 to 1.

They save a great deal of space and can be made very compact.

This is the paper machine drive in the big Portland mill of the Crown Williamette Paper Co.—Sea Lion belts and Meeseco flexible idlers. Most of the belts in this entire mill are Chicago Belting Company belts.

They win out on all cost comparisons and are in every way the best known methods of transmitting power.

Send in for data and quotations *before you buy your motors.* That is *very* important. We will submit blue prints and quotations on the complete drives including both idler drive *and* the belt.



This shows the saving in floor space and the increased arc of contact of belt drive with Pulmax flexible balanced idler. This drive pulls better than the open drive and lasts about as long. It is a wonderful drive when used with our Sea Lion Retan belt—which was made specially for this type of drive and is a great success. An outstanding success.

Made by the PRE-TESTED method

America's most economical belting

Used with flexible idlers

THE swing to leather belts with flexible idlers on beaters has been increasing faster and faster for the last three years.

The advantages of this type of drive over chains, ropes, open drives, and rubber belt drives are so outstanding that mill after mill has changed over to balanced idlers with leather belts.

Those mills still using rubber belts or chains will change over eventually—every one of them. They cannot afford not to.

Leather belts have a belt life three to four times that of rubber belts. They save power—and reduce the power factor. On power savings alone the leather belt is actually much cheaper than rubber belts and when you consider the added length of life of leather and the perfect endless leather joints there is a very strong case built up for leather belts.

For two generations the Chicago Belting Company have manufactured the longest wearing and most economical leather belting in America.

Chicago Belting belts and Meeseco short center drives are on all the ten beaters in the $2,500,000 mill of the St. Helens Pulp and Paper Mill in St. Helens, Wash. These big mills in the Pacific Northwest are putting in wonderful equipment. All the belts in this mill are from the Chicago Belting Company.

THE PAPER INDUSTRY

REG: U: S. PAT: OFF:

Vol. 9 MARCH, 1928 No. 12

Technical Control in the Pulp and Paper Industry*

By ERNST MAHLER
Vice President, Kimberly-Clark Company

I THINK we all agree that our industry in the last ten years has undergone vast changes. From one of the most highly profitable basic industries it has become, right in line with all other large industries, one of tremendous volume and narrow profit margins per unit.

While this change has been in progress on the economic side of the picture, processes of manufacture have changed from an art to a science. While for many years paper or pulp making was a craft handed down from father to son, or acquired by each worker during long years of manual training, it gradually took its place by force of necessity, among the big industries in which science plays a leading part.

What I am discussing with you is not a lot of theories, but the experience I have gained in working fairly successfully with a large organization through injecting technical men into its management in conjunction with practical operators on a purely business basis. There are places for practical men and technical men in every organization, but their activities must be strictly defined, and each must be put only where these activities point to more efficient operation, and therefore a proper return for the money spent on them.

Intelligent Repetition of Standardized Methods

Before discussing the functions of the technical man in the pulp and paper industry, and where he can be fitted in as a useful member of the organization, we should stop and reflect for a moment upon what the purpose of a paper or pulp mill is, and what is being sought to accomplish by such an institution.

The purpose of the manufacturing business is to produce a product at a profit. Therefore, the vital function of the management must be to produce a product of the highest quality at the lowest possible cost. In order to enable a manufacturer to do this successfully, he must have a well organized supervising staff who have under them a well trained and intelligent working force. The processes, either pulp or paper, in each individual mill, must deliver an absolutely uniform product. Successful manufacturing accordingly calls for intelligent repetition of standardized methods by large, well co-ordinated groups of people.

Paper mills in the past have been isolated units controlled by a master operator who did most of the thinking and planning for the entire manufacturing organization and who was quite often filled with notions and even superstitions.

Place of the Manufacturing Department

It is very evident in these days of strenuous competition that, first of all, large industries are gradually taking the place of smaller industries; and, secondly, that as a consequence of ever receding prices all the return a pulp or paper mill can expect to make must be made largely through the efforts of its buying and manufacturing organization and not, as in the olden days, through the efforts of its sales department. Therefore, in the present light, the manufacturing department, which for many years in the past was nothing more or less than a necessary evil to keep a sales force busy, today assumes the most prominent place in the entire organization set-up of a pulp and paper mill.

Now, as stated previously, in the olden days the mill superintendent was the one and only boss of the entire mill. In most cases he was a man who, by sheer determination and natural leadership, had

*An address delivered before the American Paper and Pulp Association at the fifty-first annual meeting in New York, February 21, 1928.

worked himself up from a machine tender, millwright, or like occupation to the job of a foreman. He then suddenly found himself put in charge of a mill, called on to assume overnight, as if by some magic wand, the ability to become the head of power houses, millwright shops, water-power plants, and even to specify the materials to be purchased, etc.

Problems of Management

Economic conditions have forced the paper and pulp industry, as probably the last one of the big basic industries of the country, to the necessity of scientific management—to a recognition of the fact that their process is one of chemical engineering, and that to be successful there must be a definite outline of duty for the superintendent or master operator, the chemist, the engineer, and the chemical engineer. To put it more concisely, management has become a problem of defining functions and of building men to carry them on and to co-ordinate them.

In the olden days to which reference has been made, the workman looked into the office occasionally and saw the boss sitting with his feet up, smoking cigars and talking to salesmen. He said to himself, "A fine, soft job. Wait until I get my turn at it." Finally he did get his turn, and he proceeded like his predecessor to do little except give a few orders and attempt to solve in a high-handed manner and according to his experience the difficulties that came up. He was possessed of a bag of tricks, which he threw out one after another as needed. If his experience was broad, he finally got a remedy, or the situation righted itself naturally by an error somewhere back in the process working itself out.

The days of riding on one's past accomplishments, have passed, however, and the new superintendent has a definite function. It is a man-building function and a tremendously important one.

Duties of a Superintendent

By defining functions carefully so that each man may have a clear space to grow in; by separating functions so that friction and lost motion between individuals is eliminated, and by co-ordinating these people in such a manner as to maintain a balance, a condition conducive to harmony and mutual helpfulness is obtained. Co-operation naturally results. It is, therefore, very evident that the superintendent should not be burdened with functions like maintenance, power, plant supervision, employment, and similar auxiliary and developmental duties. Inasmuch as the success of a mill is based on producing a quality product at the lowest cost, the duties of the superintendent must be confined entirely to the operation of manufacturing the best pulp and paper with the least waste, to do which requires intelligent repetition of standardized methods.

The superintendent must advance from the ranks, because no one can lead others where he has not been himself. The strength and greatest value of a superintendent do not lie in his trade knowledge and skill, which must be of the best, but in his ability to select and teach foremen to transfer this skill to carefully selected workmen. This is an entirely new element in the picture. The foregoing defines fairly well the status of the practical superintendent in the set-up of this portion of the organization in our industry.

Where the Technical Man Comes In

If the world stood still and there were no competitors who were constantly improving their methods and processes, the superintendent would probably be the only necessary executive in the manufacturing organization, because neither process nor product would change materially and he could fill the bill satisfactorily. But this is a fast moving and changing world. The raw material situation is changing constantly. Different kinds of woods must be used to supplant those which are becoming scarcer and farther removed from the mills. Higher demands for mill work and quality are made constantly on the producer of paper, as a consequence of greater refinement in the art of printing and the tremendous increase in speed of printing presses. Pulp of a higher quality is demanded by such industries as the artificial silk industry, and somewhere in the picture there must be an addition to the organization to meet this new situation. This is the point in the picture where the technical men must start to take their place in the organization.

The Place of a Research Organization

The first division of the technical organization should be a Research Department. Now so far as research is concerned, I desire to say that if in years to come you are not going to have any competition, and if you do not need profits to pay dividends to your stockholders, then you do not need a research organization; but if you want to keep your business prosperous, you must build for the future and must be fortified to meet competition. Therefore, to be a leader in the particular field to which your mills are devoted, you must spend money for the development of new ways and means, or rest satisfied that someone else is going to take that leadership from you.

I do not think it necessary that at this stage of the game a research laboratory in the pulp and paper industry should bother itself with the finding of new metals or with trying to disprove the Einstein theory, but that certain men who are qualified through the best theoretical training obtainable should attack problems in your mills that are capable of extensive improvement, or where great economies can be introduced, such as in the white-water problem or the sulphite-bleaching problem, or any other such problems wherein savings would help in a large measure to offset falling prices.

Men who have this type of training must be guided carefully because they are very likely to get

entangled in highly theoretical dissertations, which, while possibly of great value to humanity, would not show an adequate return for the business. On the other hand, a piece of research work well thought out in advance, solved, and put properly into operation always shows a very handsome return. The research division should not be bothered with the daily problems of better operation or study of the product, but must be kept entirely separated from the operating department and only co-ordinated with it through a central management.

The Building-in Division

The next division is the Technical Division, which might be descriptively termed "the building-in" division. It should be the function of this division to study operations critically and scientifically, watch the product and process closely, stop small wastes, and work out, by a close study of the process, better practices and methods. The technical men's contact with the operator is in meetings where operating methods and the product are discussed, and in working out jointly with the operator standard process practices. When basic principles are involved that may be somewhat obscure, the problem must be passed on to the Research Division for study. I shall refer to the standard practices a little later on.

Duties of Departmental Superintendents

We now have, in practice, two superintendents for each department; one is the Operating Superintendent and the other is the Technical Superintendent, to whom I have just referred. Their duties, summed up in a few short sentences, line up as follows:

Operating Superintendent—(1) Have charge of all the tools of production, which are materials, equipment, process and men; (2) keep the product up to the established standard; (3) develop foremen who teach the standard practices to every individual, and who make men assume their individual responsibilities; (4) watch for and develop understudies to follow through in the event of vacancies; (5) teach the foremen to check up on new men to see that only men who are up to our standard remain to be assimilated; (6) pass problems to the Technical Superintendent and help him by answering his questions.

Technical Superintendent—(1) Have charge of process or standard practice; (2) check up on all samples, testing station logs, and reports, daily, and go over the process in detail for variation or tendencies toward variation, reporting to the operating superintendent for corrections; (3) check up tickler against standard practice periodically to eliminate tendencies not apparent daily; (4) maintain a tickler file to remind the superintendent of periodic jobs like cleaning pipes, inspecting rolls, etc.; (5) evaluate new ideas and, if profitable and approved, work out the solution with the help of other agencies, and with the help of the operating superintendent and the staff; after final approval he must incorporate these ideas into a standard practice to teach them in class; (6) develop standard practice in meetings with foremen and head operators.

Standard Process Practices

In regard to standard process practices, it is important that the raw material which is put into the machinery be uniform and constant, but what is more important is that the man power which operates this machinery and turns the raw material into the finished product should do its work every day in exactly the same manner. Each of the operators on the three shifts every day must do his work in exactly the same way as his fellow workers have done it. Therefore it is necessary to find out the one best way of doing every job, and this one best way must be reduced to writing. This becomes the standard practice and is followed until revised by the development of a better standard practice.

The One Best Way of Doing a Thing

The development of standard practices is difficult because of the great divergence of opinion among the operators. As an example, if the subject of putting on a wire is discussed by three machine tenders operating one paper machine you will find that you will get three entirely different methods of performing the operation. Hence, it is up to the technical superintendent to develop with the three men the one best way, which, naturally, is a compromise of the three men's opinions. Even though this be a compromise, when they all work on this compromise basis the glaring faults are shown up and corrected, and gradually the practice is improved by suggestions and refinements. This keeps on indefinitely. Suggestions from the men must be received with an open mind, be given a fair trial, and if demonstrated to be an improvement, must be put into the standard practice. Finally the ideal standard practice will stand revealed.

Development of Standard Practices

The development of standard practices is a long and tedious undertaking, but I cannot see where there can be a substitute for doing each job the one best way if you want to make progress and meet or beat competition. In developing these standard practices, it is very apparent what lack of knowledge there is and what wide variation of opinion exists on even the smallest job. The result of the development of one standard practice brings out the necessity for another one further down the line. For instance, you cannot standardize on the one best way of forming a sheet of paper if you do not standardize on the consistency; you cannot standardize on the consistency if you do not standardize work in the beater room; you cannot standardize work in the beater room if you do not standardize the pulp that goes into the beaters, and so on down the line.

A Standardization Committee

It is not only necessary to standardize methods in your own mills, but when you have reached a certain point in this program you will find out the necessity of standardizing on everything you may buy from the outside that enters into the process of manufacture. This means standardizing on all purchased materials. Therefore, it is found practical to set up an organization known as a Standardization Committee. This unit should be directed by a well trained engineer, whose duty it is to work in conjunction with the Purchasing Department on one hand, and with the mill and technical organization on the other, so that nothing but the one best material is bought and so that the proper material is used in the proper place. In practice this means that you should buy only the best kind of oil, wrought iron pipe, dyestuffs, or most anything else, and that these materials should be properly applied to give the longest and cheapest service.

Benefits Derived

The greatest benefits that will be derived from the work of such a department are:

First, that you will get the best service out of your purchases; and, secondly, that by buying only the one best material and applying it to the proper place, you will reduce your warehouse inventories and liberate thereby a very large amount of your capital investment.

In like manner, equipment and plant layout problems need study by a technical equipment division or plant engineer.

An engineering and design division is needed to work out better, faster, more efficient, and more easily maintained producing equipment.

A very careful statistical and cost procedure is necessary in order to learn from previous experience and to bring out the sore places that need intensive study.

Personnel Problems

The personnel problems also need technical study and research in building better leaders, better working incentives and conditions, more scientific selective methods, better training methods, and all that goes to bring about a higher morale and improved working conditions.

An organization such as this cannot be developed by an outside agency, but must be built little by little to fit the individual needs of the specific plant. The present men must be gradually bent to assume the new positions. Such a development takes a great deal of time and patience.

To start work in this line a few figures must first be charted, best statistical, and as simple as possible. These when assimilated can be gradually developed to simple costs and to unit costs, with the material constantly getting more complicated. Then educational classes must take a definite part in the program, always teaching problems specifically applying to the work.

Recognition and Promotion

In our experience we at first thought men were only concerned with what they got in the way of pay, but we found out that a man's interest can be obtained by letting him know how well he is doing his work compared to the others, thus developing a desire to excel. This is more effective than a bonus.

There is no better way to get co-operation than by promoting the right man, because a good leader makes good men, and, conversely, there is no better way to lose co-operation and good will than by promoting the wrong man.

Contacts of the Technical Man

Under the conditions outlined, the tradesman or operator contacts in meetings with a technical man, and he perceives that underlying all that the technical man is doing there are vital principles or reasons and causes which control his operations. The technical man contacts with foremen, who are trained in classes to lead, teach, and improve habits. The employment department selectively starts in men who have the latent qualities necessary for success. The educational department provides courses of study. Out of this environment there is bound to grow a new type of individual of much greater and broader knowledge than any man that industry has had in the past.

Placing College Men in the Organization

College men must be very carefully assimilated. In our company they are passed, first, into the Research Department where they are given technical problems and taught to refer to scientific books so as to solve their problems in a technical way. They are studied to find the type of work for which they are best fitted. All departments must requisition the Research Department for technical help. When requisitions arrive, these men are passed to the technical, laboratory, or research job for which they seem best suited. If not satisfactory, they are released. If satisfactory, their training does not stop here. From then on they are responsible to their department Technical Staff Superintendent for growth. He outlines study courses for them, examines them periodically in knowledge, and criticises their attitude toward problems to see that a technical or scientific attitude is maintained. In other words, the new technical man is checked up to see to it that he gets the equipment or knowledge and experience necessary to do his work satisfactorily.

Present Position of the Industry

In closing, we may pause a moment and consider the status of the pulp and paper industry at the present time. As a consequence of over-development of the industry in Canada, we are confronted

with over-production and its inevitable results: prices closely approaching bare cost, and in many grades below cost. The result from such an uneconomical condition will be the demoralization of the pulp and paper industry, provided the industry itself does not take proper steps to set its house in order. These steps are:

1—To turn out the product better and more economically.

2—To create a wider market for pulp and paper products.

To imitate each other's products does not tend to increase either profits or markets. Closer study of the problems right in your own mills will be much more conducive to an improvement in the position of the industry than to spend time complaining of poor business. Study your operations critically with an open mind and see if, by putting technical men in their proper places alongside of the practical operators in your organization, you cannot regain some of the revenue that has been lost by the decline in prices.

Lessons in Paper Making

Lesson XIX—The Superstructure of Paper

By HARRY WILLIAMSON

Class Instructor, Champion Fibre Co., Canton, N. C.

This article is the nineteenth of a series of lessons in practical paper making, appearing each month in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course, conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

IN OUR last two lessons we dealt quite briefly and broadly with the fundamental principles governing the structural formation of paper on a fourdrinier machine. The strength factor was particularly stressed because all papers must have a basic strength, a foundation upon which can be built, added, and woven into the materials from which we develop the special characteristics which distinguish the ultimate purpose for which the finished paper is intended.

These materials we will term the superstructure, and the proportional ratio of their application to the structure, the strength factor, is one of the means by which we are enabled to produce many varieties of paper. This is more especially true when the basic structure is formed from the wood fibers; it is less true when the basic structure consists of rag. With these latter papers, variety is created primarily by a grading of the rags used, and again by the **time** and **method** of beating.

Mr. R. H. Clapperton, B. A., in a paper recently submitted before The London Division of the Technical Section aptly describes the situation when he says, "It is in the making of paper from rags that the beaterman can display his skill as a craftsman, and the art of beating must be highly developed in this branch of papermaking."

Broadly speaking, we can define the **object** of beating as the **separation, softening** and the **hydration** of the fibers. As we know, **length, fibrillation** and **hydration** equal resultant **strength,** the basic foundation of the structural formation. Granted excess latent strength owing to the quality of the naural fiber, we are enabled to reduce the length of such fiber and regulate the degree of hydration, in order to obtain special characteristics, yet still produce a paper of the required commercial strength. Hydration and softening of the fiber are capable of development without reducing the length of the fiber.

Comparative Methods Using Rag and Wood Fibers

The art of beating consists of maintaining commercial strength while developing the special characteristics by reducing the fiber to a **variable fineness.** The paper maker using rags as his raw material has a wide range to choose from. Cotton and linens, of which there are between 30 and 40 recognized grades, are the principal ingredients of such papers. The papermaker using the wood fibers as his raw material is much more restricted both as to his choice of raw materials and the application of the fundamental principles of beating to them. Yet **these fundamental principles are the same in both cases;** the difference of the degree of application is caused by the difference in the natural structure of the fiber, the latent strength and the possibilities of effecting fibrillation.

For instance, the cotton fiber is flattened and in its growth twisted. The cell wall is thin and made up of minute, natural fibrillae. The central canal is large. Such a fiber cut up quickly, beaten free, possesses bulk, opacity, and great absorbent qualities.

Prolong the beating, maintain the length, produce hydration and increase the natural fibrillation, and we have a tremendously strong paper, less bulky and of lower opacity. From a study of this staple, basic in the art of papermaking, we can derive useful

lessons which will be applicable to making paper from wood fibers.

Of the woods used, spruce, hemlock and pines are generally recognized as providing the strength factor, while the poplars, chestnut, birch, etc., provide the finer fibers. While the qualities of the cotton fibers are developed extensively in the beating operation, the qualities of the wood fibers are primarily developed in the cooking operation.

Lacking in natural fibrillae, if the ultimate strength is the object as in kraft papers, then the cooking must be easy, a very nice adjustment of causticity and sulphidity, so that incrustating substances will be left on the fibers. In the subsequent beating operation, these substances give the **effect** of fibrillation round the body of the fiber, and it is easily possible to create actual fibrillation on the ends of the fibers.

Wood pulps intended for the finer papers which necessitates a bleaching process must be prepared by an increasingly drastic cook, according to the whiteness desired. As a consequence, the strength is considerably diminished. This is readily understood when we remember that the isolation of cellulose from ligno-cellulose depends on processes of hydrolysis, is cellulose is itself susceptible to hydrolysis.

Assuming then we are to produce a sheet of envelope paper from the wood fibers, we can compare the methods used with those we would use if we had to make the same sheet from rags. The qualities desired are point per pound folio Mullen test, fold, finish bulk and opacity.

The strength factor would be a sulphite pulp, broad flat fibers, thin cell walls with pitted pores. Compared with the cotton fiber, the sulphite is very easily reduced in the beater; consequently, in order to maintain the length necessary for the Mullen and fold tests, a heavy charge in the beaters would be used, thus forming a cushioning rubbing action between the roll and the bed plate rather than a cutting action. This action would also produce hydration, and the soft pliability necessary for the Mullen and fold tests.

The hydration of the sulphite fiber would be an aid towards obtaining the desired finish, but it would also materially **lessen** the **bulk** and **opacity.** The necessary **length** of the sulphite fiber would be **against** good formation and finish, yet such length would be an aid in favor of bulk.

Formation on the Wire

As far as the formation on the wire is concerned, **bulk** is created by the air space **between** the weave of the fibers. A free beaten pulp has very little water of hydration as a constituent part of the fiber. It has, however, water of contact lodging in the interstices between the fibers. As the wet sheet comes under the influence of the suction boxes, such water is sucked from the sheet and air occupies the space vacated by the water. The free beaten fiber has very little of the colloidal jell of hydration; consequently, after the pressure of the press rolls is removed, the resiliency of the fiber, not held in position by hydrate, permits them to rise, and again air is drawn into the interstices.

A slow stock, such as prepared for the envelope, has water of hydration as a component part of the fiber, swelling up the fiber and resisting the action of the suction. The cohesive quality of the hydrate holds the fibers **down** once they have been **pressed** down. Therefore, we see that the slower the stock, the less the bulk.

With the cotton fiber, a natural twisted reticulated structure, the reserve latent strength permits of a freer preparation, a reduction of the length to gain formation and aid subsequent finish **without losing the bulk inherent to the natural twist of the fibers.**

Hydration also means increased transparency—the paper is less opaque. With the sulphite fiber treated for the envelope, we must remember we have a **long hydrated stock.** To this stock, it is necessary to introduce **a superstructure,** some other material which will help us regain **the other desired qualities—bulk, finish and opacity.**

The alkaline process of cooking wood pulp produces a softer fiber than the acid process; therefore, one part of the superstructure consists of a soda pulp possibly a poplar or chestnut. These fibers are short, soft and curly. Lighter and more volatile in their action on the wire than the sulphite fibers, they fill in between the weave of the heavier fibers. If it is especially desired to increase the bulk of the paper, the soda pulp would be fed to the beater just **before dumping.** In the latter case, the paper would also be rendered more opaque. The soda fiber having received no beating would be free. This free fiber interspersed and woven into the density of the structural formation, the hydrated sulphite fiber, breaks the continuity of formation in relation to the reflection of light. In other words, multiple surfaces are offered to the light instead of a continuous surface.

To recapitulate, we were unable to cut the sulphite fiber because it did not possess sufficient strength structurally to give us a safe margin of operation. Also in order to develop the strength, it became necessary to hydrate the fiber to an extent detrimental, as we have seen, to the other desired qualities. The long fiber will not form very closely in fourdrinier operation, and, as a consequence, the resultant finish would be mottled. The finer soda fibers will help the formation considerably, but we have still another item, a member of the superstructure family, which will also help increase the opacity and greatly improve the finish. This member of the superstructure family is the Mineral Loading group.

Mineral Loading

China clay, agalite, pearl hardening, starch—the whole loading group is sometimes erroneously accused of being merely adulterants. This is a slander, for used with discretion, they serve very useful purposes. They help fill up the pores of the paper and under the action of the calender rolls, greatly improve the surface texture of the paper.

To procure a lasting finish, when using china clay, a nice balance of hydration and calender stack pressure must be used. A well closed sheet of fairly free fiber when loaded with clay will require a much heavier pressure at the calenders to get the finish than a similarly loaded sheet formed from slow stock. Yet the finish in the first instance will be more lasting than that of the second instance. Clay is very absorbent, and if the paper is exposed to a moist atmosphere, the finish is liable to go back. The absorbent quality of the clay is a draw back to the sizing if used in excess. Used in moderation, however, it is a definite advantage to the printer, absorbing the colors rapidly and giving a clear impression.

Much of the clay added to the beater will remain suspended in the back water, and this fact must be borne in mind particularly if the mill has a closed water system. It will be found necessary to cut down the amount added to the beater after a few hours run as by that time the whole water system will be permeated with clay in suspension. This would cause the sheet to be overloaded to the serious detriment of the sizing qualities. With these sizing qualities, another member of the superstructure family we will deal next month.

A Few Simple Tests

The very accurate mechanical testing machines by which we test the physical characteristics of paper are, of course, necessary. They provide a means of recording the tests in figures both for future reference and as a guide during the actual run.

The papermaker, however, with a true pride in his art, has other methods of testing the sheet. These are acquired by experience and constant practice until they become to the senses of each individual as accurate as the data recorded by the mechanical devices. When a back tender is first set up running a paper machine, he usually painstakingly notes the set of the mechanical features of his machine for each particular grade of paper made. Thus he will note the number of turns on the stock gate and the water valve, the exact height of the slices, and the depth of the pond, the vacuum register and which particular suction box is throttled down, etc. He will also note the weight carried on the press levers, the number of calender nips used, the speed of the machine and the steam pressure used. When a duplicate order is required, he will faithfully set these mechanical features as he noted them. **Perhaps** the resultant sheet will again equal the sample and **perhaps it will not.**

Then our newly fledged papermaker realizes the necessity for further guides, and he begins to acquire a sense of "feel" for the stock. Taking a handful of stock after it has passed through the jordans, by its weight he senses the density and the heavier the stock the longer and slower the fiber. By holding the stock in the palm of the hand and gently rubbing with the ball of the thumb, he is able to gauge the wetness or freeness of the fiber. Should the fiber roll up into a little hard ball while rubbing with the thumb, it is probably too harsh, has not been worked enough, and will result in a poor fold test.

Squeezing the water from the fiber, opening the hand and spreading the fingers wide, he will notice the fibers sticking straight out from the fingers. Thus he will be able to note the **length** of the fibers. A re-check by applying similar tests to the stock **before** it passes through the jordans, and either listening to the action of each jordan or noting the power consumed to operate the jordan, will be a guide as to his best course of action.

A glance at the wire save-alls and tube rolls will also indicate to him the slowness or freeness of the stock. The freer the stock the greater the volume of water leaving the sheet and pouring into the first two save-alls. As the stock becomes slower, the early loss of water becomes less and a greater volume will be observed leaving the wire from the tube rolls nearer the suction boxes. As a knowledge of stock is acquired and his eyes become trained to reading the action of formation on the wire, our papermaker will find a decreasing necessity to adjust mechanical features of the machine merely because "they were set that way last time." He will not only be a **machine tender,** he will be a **papermaker,** to tend the machine to make paper.

Each adjustment of a mechanical feature of the machine is **definitely calculable,** and given a constant supply of **exactly** the same stock preparation, its **effect** will remain the same. Despite the closest technical control, however, the treatment of fiber from its raw state to the stock gate is only **approximately calculable.** The adjustment of the **variable** difference between the **definite** and the **approximate** is the **art,** the application of the trained senses of the papermaker.

Use the mechanical features of the machine as **plastic servants** compelling them to meet the variable stock conditions **within the calculable limits of their operation.** Keep the stock furnish and preparation in a condition which will most nearly conform to the **safe** operation of the **known** mechanical limits. This, then, will be **commercial papermaking.**

Current Thought by William Sibley

The Age of Development

LAST month, writing under the caption of "Research," I made the statement that "Necessity is not the Mother of invention—nor yet its Grandmother." Fifty years ago that statement would have been only a fractional truth. Today, the statement stands on its own merits without fear of contradictory proof. It is true, hundreds of meritorious devices have been and are being developed for a particular purpose by men employed especially to attain a specific end. But this does not alter the fact that an equal number of appliances are the developments of outsiders, or are accidental inventions. The upsetting of a tool-chest gave birth to the idea that created cast-iron cement. A Swiss mechanic, idling away his time by toying with a broken bottle and a rude oil lamp, was the start of the lamp chimney. The automatic system for railway signalling was discovered at a spiritualistic seance. The accidental preservation of a dead horse in Yellowstone park started borax on its way to its many uses. The burning of a starch factory gave the world its first gum, while Mrs. Howe, sewing with the eye of her needle foremost, gave Mr. Howe the basic idea for his sewing machine. The fact that we frequently set out to gain a special end through the development of a special device, fails to alter the fact that the building material industry can be seriously disturbed by the fluctuations in demand for sugar, that the welfare of the paper industry depends in part on the whims of the few Parisians who set the world's fashions for women, or that a pulp mill may be rendered unprofitable by the development of some little known electrician.

With frequent repetition, I made the statment that "science and engineering have assumed command," meaning thereby that with increasing speed our social political and economic lives are coming under the domination of the engineer and the scientist.

Another, and even more stupendously important fact is: **the end is not yet.** Chemists, physicians, scientists and engineers are still on the job, with the result that modern miracles continue to happen and devices, almost staggering under the weight of their own potentialities, are endlessly being produced, all of which means that unless we keep abreast of modern developments we will find ourselves occupying a most precarious position in the early tomorrow. Permanent, profitable places are available only, in the commercial world, to those who realize that five years from now we may be employing totally different machines or methods, or cultivating other strange fields for our market.

During the past four years that I have written in this place, I have now and again recited a few of the strange and wonderful developments of modern engineering and science. In this issue I will devote myself to the mere naming of a very few of the developments of 1927, because knowledge of these things is a very necessary supplement to our constant watchfulness of not only what our co-workers are doing, but what is going on in every phase of commercial science. Only by recognizing the possible influence of these recent developments can we hope properly to direct our own research and growth.

Some Things Already Here

Electrical engineers have now learned how to broadcast **power** by radio. The human mind has difficulty in grasping the import of this seemingly simple accomplishment. It means generating electric power from some remote water fall, then transmitting that power through the air, without preceptible loss, to water pumps in the Sahara, paper mills in Alaska, or metal mines in Peru. It means the substitution of light, efficient motors for the heavy, cumbersome, wasteful engines in motor trucks, aeroplanes, locomotives or steam shovels. It means wiring our homes with receiving aerials and getting our electric "juice" for light, toasters or vacuum cleaners out of the air. Practical perfection of this scheme means the immediate obsolescence of expensive coal storage equipment and boiler plant machinery, particularly for those mills located in remote sections where transportation of fuel is a heavy item of expense, or where wire transmission losses make central power unobtainable. With this development we will witness the radio controlled motorization of all heavy duty motive

power, from locomotive cranes and mill machinery to railway locomotives and automobiles. Under such a development our wire mills, battery factories, and power plant machinery makers, will be confronted with the necessity for radical readjustment.

In Freeport, Illinois, it isn't necessary to buy tubes, batteries or even a receiving set to enjoy radio programs. One merely leases a loud speaker from the telephone company, in exactly the same way one would lease or rent a telephone instrument. The speaker is connected with the telephone and merely by pressing any one of a series of four buttons, one receives his optional selection of four programs. The telephone authorities pick the programs out of the air, put them on their own telephone equipment, and give them to their subscribers, via wire. This is perhaps the first step in centralization of radio broadcasting, and it sounds the knell of parting day for static, interference, blind broadcasting, and the multiplicity of two-for-a-nickel stations that clutter the air.

The plan is not limited to telephone wires but may be adopted by electric light companies, inasmuch as the transmission of radio programs over wires interferes in no way with either the transmission of light, sound or power. Once this scheme has been universally accepted, scores of radio manufacturers will be forced out of business, radio will be centralized into a few hands, and because the subscriber must pay for his radio through his small monthly service fee, the "free" programs sponsored by radio advertisers will be at an end. Papermakers who are contemplating the radio form of advertising should hasten their step if they are going in at all, since the day of radio advertising is past high noon.

What Television Means

Not long ago a banquet was held in Washington at which the table was arranged in the form of a horseshoe. A motion picture of that entire assemblage landed on a screen in New York City, simultaneously with which the voice of the photographically reproduced speaker was heard by radio. Television is an accomplished fact.

Doubtless many of you are acquainted with the work of Dr. Damrosch, Director of the New York Symphony Orchestra, and his efforts to radio broadcast music instruction to every grade and high school in the nation. Whether or not the doctor will live to see his goal attained, time alone can tell. One thing is certain, our educational system presently will be hooked up into an almost endless chain, for the reception of radio instruction. With television developed to the point of practicability, our school children will be instructed in such things as botany, geography, art appreciation, hygiene, etiquette, and countless other subjects, from one central broadcasting source. With television, it will be a simple matter to place before the receiving instrument a Corot, or, let us say, Breton's "Song of the Lark," transmit the picture to all who would receive it by radio vision, then accompany its showing by a lecture on art appreciation. Through the instrumentalities supplied by science and engineering we presently will become the most educated and healthy nation in all history.

Furthermore, the perfection of television, together with wired radio, will mean that we can sit at our office desks and attend association conventions or interdepartmental conferences, at least in the matter of both sight and hearing. The picture of "Roxy's Gang" or the Chicago Civic Opera will be received on a ground glass screen in our homes as we listen to the musical offering.

Putting Life Into the Dead Sea

For countless centuries, the River Jordan has been pouring into the Dead Sea water that is thoroughly impregnated with bromides, potash, chlorides and other chemicals. For equally long the sun has been sucking up the water, but leaving the valuable salts. New, English and American engineers are planning on pumping Dead Sea water into great evaporation vats, permitting the flaming sun to remove the water, then gather the harvest of chemicals from the remaining liquor. This will mean cheaper sodium hydroxide for the soap maker,cleansing compounds for the housewife, potash for the explosive and fireworks manufacturer, cyanide for metal workers, bromides and iodides for the druggists, and sodium sulphate, dichromate, and dying and bleaching chemicals for the textile and paper manufacturers.

One of Chicago's most prominent modistes told me recently that a return of longer skirts was inevitable. "But few legs and knees are really shapely —and most women know it," she stated significantly. "How much additional material would be needed to make a frock of ankle length?" I then asked. "At least three yards where two were used before" she replied. With the wood pulp manufacturer now in the clothing business, the fluctuation in women's fashions are of closer concern.

Makers of insulating board for floors, wall, and ceilings have found that crushed sugar cane makes a splendid raw material. But they had to go to Cuba for their supply and this was expensive. So they drained a portion of the Everglades and now have nearly 10,000 acres in sugar cane, from which they can get a yield three times as heavy as in Cuba, and naturally with much lower transportation expense. Thus is the building material industry developing a domestic cane sugar business, with direct benefits to themselves, the housewife and the manufacturer of furnaces.

"Neonaleum" is a new metal that possesses the hardness and strength of steel but which is lighter than aluminum. "Kuprox" is another new metal that will permit the conductivity of electric current

in only one direction. "Beryllium" is a third recently developed metal that resists corrosion better than carbon steel. These metals are all European developments, where also they have discovered a liquid that will fire-proof wood, a powerful explosive made by saturating pulverized organic matter with liquid air, and a new hemp-like rope made from pine needles from which all rosin has been extracted.

A comparatively recent development is a practical method whereby carbon dioxide may be frozen, the resulting solid from which carbice has a temperature of about 125 degrees below zero. Ice concrete is also a new substance, formed by mixing crushed ice with cement and sand, then heating the mass to evaporate the water which leaves the concrete honeycombed with air cells and light in weight yet very strong.

Nothing Unsolvable to Research

In St. Louis, one firm has discovered a method for hardening oil to any degree of consistency from something akin to art gum to crystals. When used as a finish to furniture or automobiles it assumes a polish higher than enamel, yet is practically indestructible. One can strike it with a hammer or cut it with a knife, yet in a few minutes the mar will have effaced itself through the self-welding properties of the compound. It is said to be acid-proof.

Ordinary starch is being extracted from sunlight. Through the radio principle, we are now producing cold light and cold heat. Even in our comparatively efficient incandescent lamps, 90 per cent of the energy is wasted in the form of heat. In the cooking of foods we waste enormous percentages of energy by permitting the escape of heat. Now, scientists have developed a means for producing light that is without heat (much the same in character to that of a fire-fly or lightning bug) and water has been boiled without the presence of any heat other than that of the invisible and nondetectible radio waves.

By mounting a large funnel on a turntable, one company in Southern California is generating 200 horse power of electric energy from a four mile wind. A second wind power plant is now being erected which will develop 1400 h. p. Think of the meaning of this scheme for industrialists whose factories, mills or mines are inaccessible to central power or fuel supply.

Picking Gold Out of the Air

For years considerable loss has been endured in the gold smelting process at the U. S. Assay Office in New York, because quantities of the precious metal are carried off in the fumes. Now these gold bearing fumes are forced to travel between two highly charged metal plates, with the result that the particles of gold, becoming electrified, collect on the electrodes and are thus saved. Already nearly 1,000 ounces of gold has been recovered.

Searchlights so powerful as to tan the human skin at a distance of more than two miles, and capable of penetrating the densest fog have been developed. "Black light" is a new electrical ray that detects forgeries, reads secret writing and tests food stuffs. At one plant a constant stream of eggs passes on a conveyor before such a "black light." Instantly it detects any bad egg, and by means of a mechanical device, places it to one side. It can determine the percentage of cotton in so-called "all-wool" fabric, the amount of gristle contained in sausage, or tell the secrets of composition in such products as rubber, paper, or metal that are impossible to determine by surface inspection. One such mechanical eye stands at the side of a heavily trafficked boulevard. As it stares straight ahead it counts the automobiles that pass in front of it in either direction, and registers whether they are open or closed cars. Another such "eye" stares constantly at a stream of cigars conveyed before it, then casts aside all those that do not have the proper color shade of wrapper.

The comparatively new "colorimeter" is well known to manufacturers of paper, dye stuffs, inks, textiles, rubber goods, etc. An artificial larynx that restores the human voice has recently been perfected by one of our larger telephone companies.

Recently much publicity has been given to the development of the "electric man"—a mechanical slave, operated by electricity and controlled by the human voice. Placed in a power generating station this new "Telovox" controls the motors, opens and closes the switches, and performs all manner of duties with unfailing obedience to a human voice that had been transmitted from a distance of 30 miles over the telephone, then amplified by a loud speaker.

Such a list of facts could be continued almost without end. On every hand new inventions and devices are being developed with unheard of rapidity. All of the instances cited here, and countless others possessing equal possibilities for influence, have a sufficiently satisfactory laboratory history to justify their being listed as an actuality. Knowing that these things have emerged from the kingdom of Jules Verne to the realm of tomorrow's probabilities, we may be certain that our social, political and commercial existence of tomorrow will be filled with interest and wonder. All civilization is moving toward one great center—the power plant. Without waiting for even the next generation, we have come to the time when the chief builder and the controlling personality is the scientist, the physicist, and the engineer—**not** the statesman. Humanitarians, statesmen, inter-nationalists, pacifists, and preachers of high and low degree have been trying for thousands of years to bring reality to the commandment "Thou Shalt Not Kill"—but with bitter failure.

Give the engineer and the scientist just 50 years in which to make it possible to have ten million Lindberghs flying about the earth and to develop radio broadcasted sight and hearing for all nationalities and we will have such universal understanding that it will be well nigh impossible to have war. But that international understanding and virtual abolition of war will have come through the engineer and scientist—not the preacher, pacifist or statesman.

Just a few short years ago industry was enslaving humanity by compelling it to work from sunrise to sunset for starvation wages. Today, thanks to inventions and developments, it is freeing humanity from drudgery and making possible the provision of universal literacy, broader minds, and greater access to flowers, trees, grass and fresh air, the very things that seem most incompatible with a machine-made age.

This is the age of development. Applications for rights of protection pour into the U. S. Patent Office at the rate of 40,000 per month. It is being said by some that we are progressing too fast—that we are inventing far more rapidly than it is possible for us to execute. Maybe so. Certainly our mechanical development is making it increasingly imperative that we readjust our advertising and selling methods in order that demand may be increased to sufficiently absorb production. But whether we like it or not, the flood of inventions and the tide of mechanical developments continues to rise. Each succeeding day faces new considerations. Engineering and science is making this the age of development. Many of these developments bear heavily on the paper industry. Lack of foresight with relation to new machines, new methods or new materials may spell the difference between success and failure. Certainly this is no time for the executive to keep his eyes focused on his own, individual desk.

Direct Contact with the Worker

By HERBERT D. ALLEN
Vice President, Elliott Service Co., New York

This article is the second of a series which began with the February issue of The Paper Industry. Succeeding subjects will be: Foremanship Development; The Key Position of Man Power; Developing Mass Psychology in the Paper Mill.

LAST summer, in a large shoe manufacturing company employing over 20,000 workers, a foreman was discharged. He was in charge of upper leather cutting in a plant whose product was being changed. Trained on work shoes, he was simply unable to shift over his department to cutting leather of the slightly higher grade used in cheap dress shoes.

Production was not keeping ahead of the department following. Spoilage was enormous. Both the quality of the product and the average earnings in the department had gone so far down, that the whole piece rate scheme of the company was disturbed. Given every opportunity to make the grade with special training instructors in his department for two months, and not responding, the foreman was let go.

About 120 men under him walked out, stung by a long period of low earnings and by the "harsh treament" received by a man they liked. A committee of workers was appointed and waited upon the factory superintendent. He stood on his dignity and authority, and the committee went on up through the general superintendent, the general manager, and then to the vice president in charge of manufacturing.

Over impressed with the sanctity of a line organization, relying upon authority rather than understanding, each executive upheld the man below him. In fairness to these men it should be said that they did not believe they should divulge to the workers "company secrets"—in reality changed conditions in an industry—which had made necessary a changed manufacturing program.

The company had gone the limit on all forms of welfare and social work, but it was all laid down from on top. The company never before had known a strike. Ugly conversation went the rounds that evening and the president was called in from out of town.

He got the group of workmen together, listened to their story, explained the shift in styling and pricing that was going on in the industry, laid before them the earnings of workers on the same operations in other plants of the same company, and restated the policy of the company as to the above-standard earnings they wished their employees to make. He evidenced his sincere conviction that the job of the foreman was as much to work for and represent the men in his department as it was to represent the company, and that the action was taken as much for the men's benefit as for the company's.

The men went back to work under a foreman who knew his job and what the manufacturing situation demanded, and within a month the department had come up to standard operation and the workers were enjoying standard earnings.

Direct contact with the worker had changed a situation loaded with dynamite into normal, success-

ful manufacturing harmony. Yet it is obvious that no one executive can keep in direct personal contact, continuously and constructively, with 20,000 workers or 1,000 or 500 for that matter, or even with their direct supervisors. Even though that executive had no other responsibilities of a general administrative, sales or financial nature, there are not enough hours in the day.

Thousands of highly successful executives are today getting direct contact with their workers

A production poster set in frame—one of the units of the Elliott Service

through an intelligent use of specialized bulletin boards. Through a highly organized program of internal publicity, they have established a daily, interested attention for these boards, and they have become the most effective point of contact between management and men.

One of the reasons for their effectiveness is that the worker is used to reading mill notices on a bulletin board. Installing a really attractive and impressive bulletin board strikes him simply as a normal mill improvement. It does not tend to put him on his guard or make him suspicious as does a change in organization, compensation or even the introduction of a company publication.

The Good Will Value of Direct Contact

In speaking before the Foreman's Club of New Haven, Conn., on January 31st, Secretary of Labor Davis gave very interesting evidence of the attitude of the worker, in telling these foremen how industrial peace had been established through direct contact. In part he said, referring to conditions 25 years ago,

"As I look back on that day I would say that opportunity then was not so free and plentiful as it is today. Management and men had got a long distance apart. The human element had been lost sight of. The old personal contact of employer and worker had vanished. It was organization dealing with organization. All industry was then run through the operation of delegated authority. The worker and his employer never really knew each other. And this bred a natural suspicion and hostility."

There is some fairly simple psychology involved here, but like most simple things it is also fundamental. We fear what we do not understand. This is basic. A horse shies at a piece of white paper. Babies whimper and cringe at a sudden **loud** noise. We are suspicious of strangers in a pioneer community because we do not understand them—we fear them.

Again, what we do not understand is strange to us and we say it is "wrong." To a child, a new way to hold a fork is always the "wrong" way—the "right" way is the way we understand. A new idea, of religion, government, social ethics, is stated or proposed. Immediately the cry goes up—"It is wrong."

Now this has a tremendous bearing on industrial relations, because business is growing and changing so fast that the worker must accommodate himself to frequent changes in the "right" way to do his job, to being paid for what he does, to keep the necessary records, in the relations between the various departments, etc.

More dangerous to industrial harmony is the result of fear. **We seek to destroy what we fear.** This is the instinct of self-preservation. It is accountable for most of the wars of history, all religious persecution, and is the only explanation for the bitterness of the industrial warfare which was so destructive to the welfare of American industry for such a long period.

Let conditions necessitate a change in your manufacturing methods, and unless they are carefully explained to your workers you will run into this cycle of (1) failure to understand; (2) fear of the unknown; (3) destruction or obstruction.

Helping the Worker to Understand

There are many good reasons why the condition Secretary Davis described was so harmful to manufacturing profits and so hard to change. Power over other men is a hard thing to handle constructively. The further down you get in a line organization the more likely is the immediate boss to say, "Do this because I tell you to" rather than to explain the necessity for a changed operation due to changes in market demand, changes in manufacturing method,

etc. In most cases the foreman or boss himself doesn't know why.

Yet nearly every change in paper manufacture today tends to increase the individual productivity of the worker and is therefore to his own selfish interest. But he must be helped to understand why that is so. As stated in the preceding article, the problem here is to get across to the worker some fairly simple business economics.

For the paper industry, the economics necessary for the worker to understand seem fairly simple. The worker should understand that the industry has more productive capacity than the market, generally speaking, can absorb. It is therefore a buyers market, with the buyer constantly demanding better quality while he hammers at the price. The reason for the existence of the mill is to create a profit through manufacture. If that profit does not continue, the worker will lose his job or suffer reduced wages. He therefore must do everything he can, **selfishly**, to help to maintain quality, reduce waste, and to increase individual productivity.

As Herbert Hoover said in a message to workers, distributed through the Elliott Plan:

> "An increased standard of living for the whole Nation depends upon **maximum individual production** within the proper limits of the human machine. Let each do his part."

How to Make Direct Contact Effective

But the use of bulletin boards for maintaining direct contact with employees is not a new idea. In fact, nearly every mill has a bulletin board of some description. Moreover, many mills have tried putting some typewritten messages on home made bulletin boards and have been disappointed in the lack of interest or results obtained.

I am reminded of what happened so often in the early days of advertising. It went something like this:

"Advertising is a good idea." "Let's advertise." "Write some good hot copy and give it to the printer." "Let's mail a couple thousand of these to our toughest prospects." And, usually, nothing happened. "Advertising's no good. It's the bunk. Let's cut it out."

To those of us who have spent some years in changing other people's opinions, thinking and **feelings**, through the medium of the printed sheet, it's a serious business. It involves so much of knowing how the man we are trying to influence thinks and feels, and such constant contact and familiarity with all the other influences to which he is exposed.

If it is worth doing at all, this business of direct contact, it certainly must be worth doing well—intelligently, honestly, sincerely, expertly.

If you are going to talk to your workers through the medium of a bulletin board, let that bulletin board be good enough, and impressive enough so that it typifies the importance and dignity of management. A dusty, makeshift unattractive board full of old material, will get just about that much attention from the worker, and maybe the worker is justified in paying about that much attention to it.

Then comes the problem of what to put on the board. This is a real difficulty. Most of us are fairly human, likeable, simple and easy to understand when met face to face. But put a pencil in our hands, or a stenographer poised before us ready to take down

An accident prevention poster in frame—another unit of the Elliott Service

each word of wisdom as it falls, and what happens?

We preach, we scold, we pontificate, we patronize, we cover up our real selves until our friends, customers or employees have a perfect right to say, "If that's the kind of a fellow he is, I don't like him."

The Technique of Direct Contact

Nearly every thing management normally has to say to workers comes under these general heads:

General Business Economics (A better understanding of the job) including the necessity for making a profit in a competitive market; the need for greater individual productivity; the importance of craftsmanship—knowing and doing one's job; cooperativeness; how to profit by mistakes; making suggestions; the importance of keeping interested in the job, etc.

Maintenance of Quality

The importance of quality in a competitive market; quality and the sales department's problem; what

is value?; visualizing the indivdual buyer, etc.

Waste Reduction

This includes accident reduction, material waste, time waste, waste due to ignorance, carelessness, etc.

Production Stimulation

The necessity for increased output per worker due to his own efforts, as contrasted to increased output per worker due to better machinery, layout, scheduling, etc. Interdepartmental competition, comparative records of other mills, etc.

Company News

This offers possibly the greatest opportunity to management. If all direct communication on the board keeps the news slant, informative, timely and brief, almost any amount of company information, policies, results, quotas, budgets, etc., can be gotten across even to foreign speaking labor.

Employees will gossip, whether management desires it or not. Undirected gossip always tends to become destructive, due to our natural self-consciousness towards anything of an "uplift" nature. But rightly done, management can give the workers constructive news about which to gossip and argue.

Stimulation and education of the worker in his mental attitude and morale will bring about an approach to the ideal condition of making every **department** and **every worker** profitable.

The effects of such stimulation and education are:

1—A clearer understanding on the part of the worker of the simple economics of American business.

2—A finished product closer to the determined standard of quality, without increased cost of supervision or increased material waste.

3—Non-financial incentives play a larger part in keeping the worker content and efficient.

4—Labor turnover, with its resultant waste of time, material and machine productivity, will be reduced.

5—Waste of time, materials and machine productivity is reduced as the "team spirit" increases.

6—Accidents, with their direct first cost and their negative effect on morale, labor turnover and general productivity, will be reduced.

7—Increased productivity per worker.

Effects on Workers

The benefits of such a personnel development effort, however, are by no means all one-sided. In a very real sense they are shared by the workers.

Obviously, the best service an employer can perform for his employees is to manage his business so skilfully that it will be successful and continue to enjoy increasing prosperity. Only as long as the business succeeds, can the workers be given any reasonable assurance that they will continue to have steady employment at satisfactory wages and under favorable working conditions. Consequently all of the effects listed in the foregoing as benefits accruing to the employer—because of their important bearing on efficiency in production—are, likewise, benefits which are positively shared by the employees.

Equally important, also, are other advantages of a less material—though none the less desirable—character enjoyed by the worker as a result of this plan of stimulation and education. Eminent among these are the following:

1—Greater enjoyment of his work, because of more accurate visualization of the importance of his job and its relation to the collective productive effort. Bigger conception of his part in rendering valuable service to consumer of product.

2—Development of pride in quality workmanship.

3—Satisfaction derived from effective "teamwork" and the influence of high morale.

4—Awakening of his ambition to improve his ability and efficiency. Broader view of possibilities for his own personal development and success.

5—Contentment and enthusiasm on the job reflected in happier home life and growing desire to improve cultural standards of his family.

Air Pockets in Belts

By W. F. SCHAPHORST, M. E.

AN OFFICIAL of a prominent manufacturing company recently wrote to me concerning belts that were developing air pockets and opening at the laps. He didn't know whether the trouble was due to the cement that was used, or to the hide of which the belts were made.

In my reply I said this:

"From your letter I would judge that the trouble is due to faulty workmanship rather than poor cement or hide, unless all of the joints give the same trouble. If only an occasional joint opens up and if the same cement is used in all joints, my opinion is that the joint that opend up was improperly made.

"It may be that the same workman produced all of the faulty joints by using cement that was too thick. If cement is too thick it is liable to break and then due to the grinding action of the high speed belt, the cement powders and the area of powdering gradually increases until the joint fails.

"Air pockets are bad because the air is pushed backward during the movement of the belt and in making its escape it pushes its way out between the laps, thereby loosening the cement. For this reason air pockets are more troublesome in rubber, balita similar belts than in leather belts because in some instances air pockets have been known to loosen the cement throughout the entire length of the belt.

"About the only way in which cement can be tested is to use it on samples of leather and then pull the pieces apart in a testing machine.

"By recementing a joint that has failed and testing it for strength, you would have a sort of check on the cement but it would not be as satisfactory as an actual operation test. I do not know of a method of testing that will completely settle a joint trouble of this kind."

A wise man will desire no more than he can get justly, use soberly, distribute cheerfully, and leave contentedly.—Benjamin Franklin.

The Paper Industry 1928 Safety Contest

January Scores

42 Mills Start Contest with Perfect Score

PERFECT SCORES

	PARTICIPANT	MILL	LOCATION
Group A	Nekoosa-Edwards Paper Co.	Port Edwards	Wisconsin
	Kimberly-Clark Co.	Badger Globe	Neenah, Wis.
	International Paper Co.	Niagara Falls	New York
Group B	Nekoosa-Edwards Paper Co.	Nekoosa	Wisconsin
	International Paper Co.	Piercefield	New York
	Finch Pruyn Co., Inc.	Glens Falls	New York
	Chemical Paper Mfg. Co	Holyoke	Massachusetts
	Fort Howard Paper Co.	Green Bay	Wisconsin
	Racquette River Paper Co.	Potsdam	New York
	Port Huron Sulphite & Paper Co.	Port Huron	Michigan
	Hollingsworth & Vose Co.	West Groton	Massachusetts
	Strathmore Paper Co.	No. 2 Woronoco	Massachusetts
	American Writing Paper Co.	Riverside	Holyoke, Mass.
Group C	Beveridge Paper Co.	Indianapolis	Indiana
	Defiance Paper Co.	No. 2	Niagara Falls, N. Y.
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	Marinette & Menominee Paper Co.	Menominee	Michigan
	American Writing Paper Co.	Lynden	Holyoke, Mass.
	Adams Bag Co.	Chagrin Falls	Ohio
	Defiance Paper Co.	No. 1	Niagara Falls, N. Y.
	Gardner & Harvey Co.	No. 1	Middletown, Ohio
	Kimberly-Clark Co.	Atlas	Wisconsin
	Union Bag & Paper Co.	Fenimore	Hudson Falls, N. Y.
	Hawthorne Paper Co.	Kalamazoo	Michigan
	American Writing Paper Co.	Nonotuck	Holyoke, Mass.
	American Writing Paper Co.	Albion	Holyoke, Mass.
	American Writing Paper Co.	Dickinson	Holyoke, Mass.
	Upson Co., The	Board	Lockport, N. Y.
	Thilmany Paper & Pulp Co.	Tissue	Appleton, Wis.
	Defiance Paper Co.	No. 3	Niagara Falls, N. Y.
	Warren Mfg. Co.	Hughesville	Riegelsville, N. J.
	American Writing Paper Co.	Mt. Tom	Holyoke, Mass.
	Sorg-Oglesby-Smith Paper Co.	Smith	Middletown, Ohio
	International Paper Co.	Riley	Maine
	Kimberly-Clark Co.	Neenah	Wisconsin
	U. S Gypsum Co.	N. Kansas City	Missouri
	U. S. Gypsum Co.	Gypsum	Ohio
	Lawrence Paper Mfg. Co.	Lawrence	Kansas
	Warren Mfg. Co.	Riegelsville	New Jersey
	American Writing Paper Co.	Wauregan	Holyoke, Mass.
	Gardner & Harvey Co.	No. 3	Middletown, Ohio
	Robertson Paper Box Co.	Rockland	Montville, Conn.

IMPERFECT SCORES

GROUP A				GROUP B				GROUP C			
		Points				Points				Points	
Key	Rank	Credit	Debit	Key	Rank	Credit	Debit	Key	Rank	Credit	Debit
A-12	4	470.230		B- 1	11	440.515		C- 5	30	282.900	
A-14	5	467.500		B-31	12	412.815		C-38	31	251.045	
A-11	6	415.615		B-17	13	391.065		C-22	32	241.230	
A-10	7	388.930		B-18	14	388.670		C-11	33	171.885	
A-15	8	376.885		B-13	15	370.330		C-44	34	130.055	
A-18	9	344.615		B- 4	16	335.170		C-32	35	69.285	
A-34	10	327.170		B- 6	17	286.785		C-19	36	4.885	
A- 9	11	315.485		B-14	18	283.355		C-14	37		13.955
A-17	12	302.015		B-15	19	265.870		C-54	38		14.500
A- 5	13	300.315		B-25	20	256.700		C-52	39		159.630
A-22	14	286.655		B-24	21	238.030		C- 7	40		188.145
A-16	15	282.630		B-22	22	194.900		C-24	41		249.030
A-25	16	264.400		B-33	23	194.430		C-26	42		272.930
A- 3	17	233.470		B-12	24	177.060		C-50	43		276.770
A- 4	18	182.545		B-19	25	174.080		C-34	44		302.630
A-26	19	63.485		B-21	26	54.800		C-59	45		415.030
A- 1	20		44.915	B-34	27		126.200	C-28	46		508.345
A- 8	21		152.915	B- 7	28		162.410	C-25	47		539.600
A-23	22		425.245	B-27	29		177.800	C-18	48		670.080
A-21	23		469.345	B-32	30		327.415	C-45	49		717.245
A- 2	24		593.000	B-36	31		389.415	C- 6	50		744.340
A-20	25		1123.545	B-30	32		612.085	C-10	51		804.585
				B- 9	33		718.185	C- 8	52		891.255
				B-28	34		719.600	C-55	53		922.630
				B- 5	35		1054.385	C-21	54		998.730
				B-35	36		1388.145	C-16	55		1020.085
								C-35	56		1486.930
								C-31	57		1510.385
								C- 4	58		1808.785
								C-48	59		2434.930

Group A, A-19 Not reported.
Group C, C-36 Not reported. C-57 Not operating.

NASACO LOG

Future Safety Meetings

March 21-22-23—Philadelphia
Annual Pennsylvania State Safety Conference

April 11-12-13—Lansing
Second Annual Michigan State Safety Conference

April 25 or 26—Newark, N. J.
Fourth Annual Eastern Safety Conference

April 30-May 1—Boston
Seventh Annual Massachusetts Safety Conference

May 21-22—Erie
Northwestern Pennsylvania Regional Safety Conference

June 6—Oshkosh
Fourth Annual Fox River Valley Safety Conference

New York City Gets National Congress

The Seventeenth Annual Safety Congress will be held in New York City the week of October 1 to 15, 1928. Not since 1921 has the national congress been held in an Atlantic Coast city, and a record attendance is expected.

The Niagara Falls mill of the International Paper Company has added to its laurels another safety trophy. The Associated Industries of New York State recently awarded this mill a bronze plaque for completing a period of thirteen weeks without lost time. This mill was the winner in Group B of THE PAPER INDUSTRY 1927 Safety Contest, and is taking its place in the front ranks of the 1928 Contest.

Safeguard on Paper Cutting Machine

The Nekoosa-Edwards Paper Co., Port Edwards, Wis., has installed an interlocking device on its paper cutters. This device is positive, and not only requires that the operator use both hands(one to throw the clutch and the other to raise the interlock), but when released, it prevents the machine from repeating.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of January 31, 1928

Participant	Mill	Rate	Participant	Mill	Rate
International Paper Co.	Riley	0	The Gardner & Harvey Co.	Mill No. 3	.24
Kimberly-Clark Co.	Neenah	0	Union Bag & Paper Corp.	Allen	.47
Lincoln Pulp & Paper Co.	Lincoln	0	International Paper Co.	Livermore	.56
U. S. Gypsum Co.	Gypsum	0	Lincoln Pulp & Paper Co.	Lybster	.59
The Upson Co.	Board Mill	.05	Robertson Paper Co.	Montville	.60
Kimberly-Clark Co.	Atlas	.09	Union Bag & Paper Corp.	Mill No. 5	.62
The Adams Bag Co.	Chagrin Falls	.14	Itasca Paper Co.	Minnesota	.70
International Paper Co.	Winnipiseogee	.15	Mead Pulp & Paper Co.	Peerless	.89
International Paper Co.	Webster No. 9	.15	The Northwest Paper Co.	Brainerd	2.88
The Gardner & Harvey Co.	Mill No. 1	.15	Union Bag & Paper Corp.	Fenimore Paper	2.94
Bergstrom Paper Co.	Neenah	.18	Lincoln Pulp & Paper Co.	Sulphite	3.71

Group A—Nekoosa-Edwards Paper Co. Combined Mills .78

Group B—International Paper Co., Niagara Falls .30

Power Requirements For Pumping Paper Stock[1]

By RUSSELL K. ANNIS

Pump Division, Fairbanks, Morse & Company, Chicago

AT THE American Pulp and Paper Mill Superintendents' convention at Richmond, Va., in May 1927, M. B. MacNeille, manager of the pump division of Fairbanks, Morse & Co., and an associate member of the Technical Association of the Pulp and Paper Industry, delivered an address on the subject of "Developments in the Pumping of Paper Stock." It is the purpose of this paper to report the further studies that have been made on this subject.

It is practically impossible for a centrifugal pump of the conventional type, having sharp impeller blades, to pass

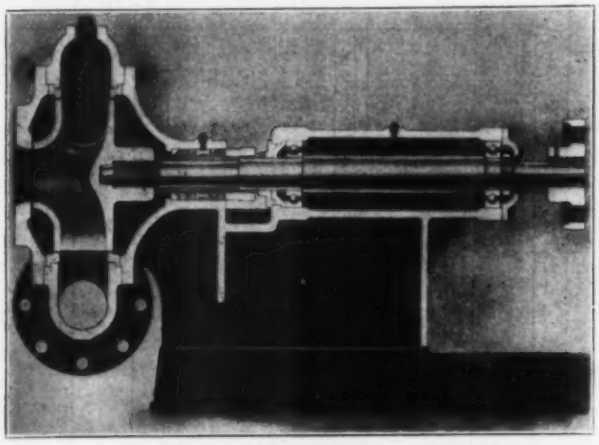


Fig. 1—Sectional view of Fairbanks-Morse paper stock pump of the two blade type

particles of fibrous material without clogging. Such material quickly catches on the sharp blade ends at the entrance of the impeller and is held thereon by the water stream lines passing through the pump. As more material comes through, it packs on and the pump finally is entirely choked and must be opened and cleaned. One of the most recent interesting developments in pumps for handling paper stock is the Fairbanks, Morse stock pump patented by A. B. Wood. This pump has already shown highly satisfactory results in the handling of paper stock of various consistencies in a number of mill installations. This type of pump was designed for the New Orleans Sewerage and Water Board in the development of a centrifugal pump which would pass large solids, stringy material, trash, leaves, rags, and other material that is invariably found in sewage.

The Requirements of Sewage Pumps

The City of New Orleans has experienced much difficulty and many interruptions of service due to clogging and stopping of the equipment that it was using . This convinced Mr. Wood that there was a need for better pumps and he originally set out to develop a pump which would meet the following conditions:

1—Pass solids almost as large as the discharge or suction openings of the pump.

2—Handle twigs, rags, roots, leaves, etc., without clogging.

3—Develop very steep capacity-head characteristics so that a strong reserve pressure would build up when trash or foreign matter tended to clog up the pipe lines.

4—Be readily cleanable in the event of large foreign bodies entering the suction pipe too large to pass through the impeller.

5—Develop reasonable efficiencies over a wide range of capacity.

About three years ago, Fairbanks, Morse & Co., secured the manufacturing and selling rights under the Wood patents, and immediately thereafter its sales organization encountered and presented to its engineers, many new and interesting industrial problems for the application of Wood pumps, among which was the pumping of paper stock.

Description of the Wood Pump

The impeller of the pump has very open waterways with smoothed edges that will pass any materials that enter, regardless of shape or texture, up to the dimensions of a sphere in diameter equal to that of a pipe one size smaller than the discharge opening of the pump. The outward appearance of the Wood pump resembles the ordinary clear water, side suction, centrifugal pump intended for heavy duty. At the entrance the blades are rounded on a considerable radius and are filleted with the sides or shrouds with a considerable radius so that throughout the impeller waterways there are no sharp edges, corners or projections on which materials may catch and clog. Two blades are provided, as Mr. Wood sought in his design to reduce the number of impeller passages to the minimum required for balanced rotation and symmetrical construction. It will be noted that the blade gradually tapers to a narrow edge at the outer periphery of the impeller and that the blade end occupies but little of the periphery. Further, the form of the blade is such that a strong wedging action described by Mr. Wood as a coughing action is exerted on materials passing through the impeller while they are being discharged into the pump casing. It is apparent that mechanical and hydraulic balance are impossible in any design having less than two blades. The cross-sectional view of the Wood pump (Fig. 1) clearly illustrates its enclosed impeller construction, the large clearances provided throughout, the rugged shaft mounted on ball bearings, and the absence of bearings within the pump case which would be affected by materials passing through the pump.

Pump Performance Experiments

It is interesting to study the performance of a 6 inch pump having two blade open impeller construction of the older design as compared with the performance of a 4 inch Wood pump. Both pumps are equipped with impellers 11 inches in diameter and both are tested, at a speed of 1750 R. P. M. by the same Sprague dynamometer. The solid lines (Fig. 2)

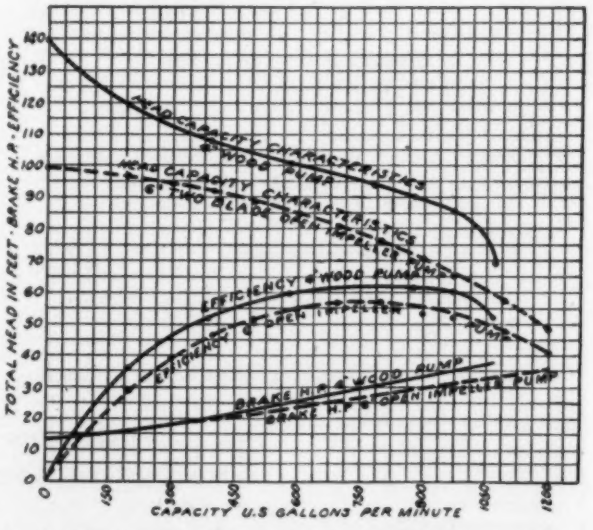

TOTAL HEAD IN FEET · BRAKE H.P. · EFFICIENCY
CAPACITY U.S GALLONS PER MINUTE
HEAD-CAPACITY CHARACTERISTICS 4" WOOD PUMP
HEAD CAPACITY CHARACTERISTICS 6" TWO BLADE OPEN IMPELLER TYPE
EFFICIENCY 4" WOOD PUMP
EFFICIENCY 6" OPEN IMPELLER PUMP
BRAKE H.P. 4" WOOD PUMP
BRAKE H.P. 6" OPEN IMPELLER PUMP

Fig. 2—Comparative performances of a 4 in. "Wood" pump and a 6 in. pump having two blade open impeller construction which is an attempt to imitate the Wood pump without infringing on the patents

indicate the characteristics of the 4 inch Wood pump and the broken lines indicate the characteristics of the 4 inch Wood pump and the broken lines indicate the characteristics of the 6 inch open impeller pump. Of noteworthy interest is the high shutoff head developed by the 4 inch Wood pump which

[1]Paper presented at the thirteenth annual meeting of the Technical Association of the Pulp and Paper Industry in New York, February 20-23, 1928.

reaches the value of 140 feet as compared with 99 feet, the shutoff head devolved by the older design. Mr. Wood's wedging blade form is responsible for this difference and for the fact that a higher head throughout the pump's effective working range is developed with better efficiency and with little change in the horsepower consumed. It is further interesting to note that the 4 inch Wood pump falls very little short of pumping the same quantity as the 6 inch pump with which it was simultaneously tested.

Impeller Improvements

After Wood pumps had been applied to pumping paper stock and various experiments had been conducted, it was Mr. Wood's opinion that the heavier stocks, such as high density kraft could be handled more efficiently if the impeller blades were brought back into the impeller eye and tapered to the center of the hub so that the blades could take hold of this heavy material at the very center of the shaft and begin forcing it outward to the pump case. This impeller (Fig. 3) has been found very effective in handling power stock, since it eliminates the tendency of the strong suction existing at the impeller entrance to separate the water from the stock, which tendency is found in most centrifugal pumps when heavy stock is handled. When coarse stocks, such as bagasse, are being pumped, this tendency to pull the water away from the stock is particularly pronounced. This type of impeller is at present being fitted to all Fairbanks-Morse, A. B. Wood patent, centrifugal pumps for paper stock, and patents have been applied for on this new feature.

Applications of the Wood Pump

Since Mr. MacNeille presented his paper, a great deal of progress has been made with Wood paper stock pump. There are now more than seventy of these pumps in operation, and the experience and data derived from these installations are very enlightening. These installations include pumps of all sizes from 3 to 8 inch. The 3 inch pumps have been used principally on lime sludge and white water. The 4 inch pumps have been used to handle a wide range of material, including paper stock up to 4 per cent at 300 g. p. m. The 4 inch pumps have also been used with excellent results for handling caustic sludge up to 25 per cent. One 4 inch pump at the St. Lawrence Paper Mills is used to empty the stock chest every week and

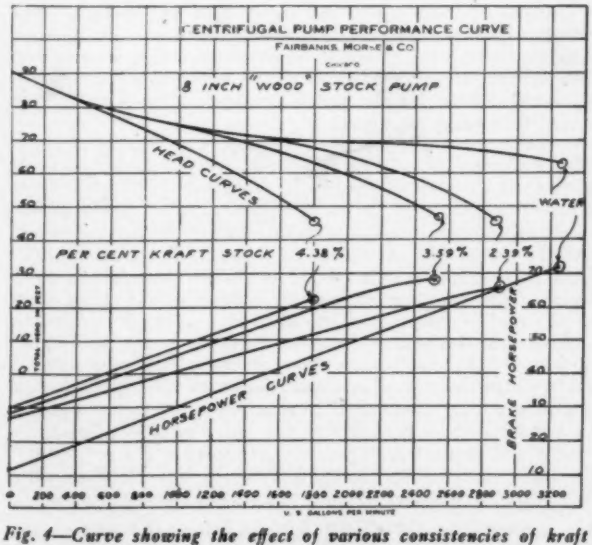


Fig. 4—Curve showing the effect of various consistencies of kraft stock on the head and horsepower of an 8 in. pump

is satisfactorily handling thin stock and tailings under difficult conditions.

The Tumwater Paper Company has two 4 inch pumps, one of which is unusual in that it is a vertical pump. This is one of the standard designs for handling sewage and is satisfactorily handling 4 per cent broke stock. The 5 inch pumps are also used for a wide range of service including the handling of 5 per cent unbleached sulphite paper stock at 470 gallons per minute.

The Great Northern Paper Company of East Millinocket, Me., has six 5 inch pumps for handling 3 per cent stock, and these replaced other stuff pumps which were unsatisfactory. This service is difficult in that a pump of very steep characteristics is required for feeding a paper machine in order to get a fairly constant capacity.

Perhaps the most popular size for general use in a paper mill is the 6 inch pump; it will handle kraft stock up to 6 per cent. The Brown Company has a 6 inch Wood pump at Latuque, Quebec, and this pump is equipped with a pulley

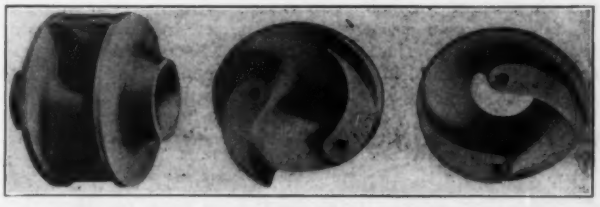


Fig. 3—A "Wood" patented impeller with one view showing the whole impeller and the same impeller sectionalized to show the shape of blades

for belted service. It has been found to give satisfactory service. There have been only a few installations requiring capacities greater than can be handled by 6 inch pumps. Wherever such conditions had to be met, an 8 inch pump has been used. At least three pumps are being used for handling stock at densities of 5 per cent and over.

Determination of Power Requirements

In planning a pump unit for handling paper stock one of the most vital questions is the determination of the power required. This depends upon a great many factors, and it is doubtful whether any system of mathematics will ever be developed which will indicate the power requirements of a paper stock pumping job with scientific accuracy. There are, however, practical methods of arriving at power requirements which have been found to be adequate. The capacity requirements, and the static head, (otherwise referred to as the vertical lift) are always easy to determine. Unfortunately, however, the head against which the pump actually works is always considerably higher than the static head, as there is always some pipe friction. Usually the pipe friction is greater than the static lift itself. The friction depends upon the kind of stock being pumped, its consistency, the capacity of the pump, the size and length of the pipe line, and the number of fittings. The kind of pipe being used is also an important feature, as a wood lined pipe is smoother than a galvanized spiral pipe; and the spiral pipe is smoother than a rough cast iron or wrought steel pipe.

In the last analysis, therefore, the friction of paper stock in a pipe line must be determined by experimentation and is not strictly subject to ordinary mathematical calculation. Fortunately, however, tables are available which are approximately correct, if they are used with reasonable care. So far as we can learn, these tables have all been derived from a single set of experiments and for that reason one table cannot be used as a check on another for its accuracy.

Status of Textbook Data

We have come to this conclusion after reading the chapter "Total Working Head" in the textbook known as **The Manufacture of Pulp and Paper.** This is a textbook of modern pulp and paper mill practice prepared under the direction of the Joint Executive Committee on Vocational Education, representing the pulp and paper industry of Canada and United States. It is a very complete work and it is perhaps the latest authority on paper mill technique as it was issued in 1925. Nevertheless, the admission is made in this text that about all the information available bearing on this sub-

ject is based on a series of extensive and exhaustive tests made in 1907 by E. J. Trimbey at the Glens Falls plant of the International Paper Company. Since that time paper mill practice has gone through some important changes and tables which were satisfactory then, today often prove to be inadequate.

The pipes used in the experiment were spiral, galvanized iron pipes. Both groundwood and sulphite stock were used and gave practically the same results. However, no tests were run on kraft or rag stock. Undoubtedly the friction of kraft stock is much higher than for either groundwood or sulphite stock, and perhaps the friction of rag stock or newsprint is considerably lower. The condition of the inside surface of the pipes has a large influence on the friction met with, but we do not have any data showing how much influence the condition of the surface exerts.

The tables do not show the friction of any stock heavier than 4 per cent, although we know that stocks up to 6 per cent are being handled by centrifugal pumps. There does not appear to be any data available regarding the friction of paper stock beyond 4 per cent, and when we encounter these heavier stocks the friction must be estimated. The important point about all of this is that when we work with pipe sizes other than 6, 8, 10 or 12 inch, or when we work with other kinds of pipes than spiral riveted galvanized iron, or when the stock is heavier than 4 per cent, or when the stock consists of other material than groundwood or sulphite, we are working more or less by guess, and the result must be an estimation. Further than this, there appears to be no data available on the friction produced by elbows, and it is evident that an elbow will produce a large amount of friction in the pipe line, especially if a short radius elbow is used.

Importance of Steep Pump Characteristic

On account of the fact that the frictional head, and, therefore, the total head on the pump, is always more or less of an indefinite matter, a pump with a steep characteristic will always be a more satisfactory installation. The reason for this is that in case the head is a few feet higher or lower than that which is estimated in advance, a pump with a steep characteristic will deliver very nearly the estimated quantity of stock, in spite of any discrepancy in the head. If, however, the characteristic of the pump is quite flat, a few feet more or less in the head may cause the pump either to discharge altogether too great a quantity, or its discharge may be seriously diminished or cut off and deliver nothing at all. The Wood paper stock pump has a very steep characteristic on account of the wedging action of its blade.

Fig. 5—8 in. Fairbanks-Morse paper stock pump in the Eddy Paper Company's mill at Three Rivers, Michigan, handling as high as 6 per cent stock

In the same text to which we have referred, there is a chart which shows the influence of various consistencies of paper stock on the performance of a pump. This chart would indicate that it is impossible to pump paper stock of heavier consistency than 4.5 per cent. This was undoubtedly true with the type of pump available in the year 1907. Today, paper stocks of 6 per cent and even heavier are being pumped, but so far there is little known regarding the performance of the pump handling the heavy stocks as compared to the same pump handling water.

Test at Thilmany

Recently, a series of tests was run by the Thilmany Pulp & Paper Company at Kaukauna, Wis., on an 8 inch Fairbanks-Morse Wood paper stock pump, and a chart (Fig. 4) has been prepared showing the relation of the performance of this pump handling stock of various consistencies, compared with the performance of the same pump handling water. The data indicated in the chart is interesting and undoubtedly the relation will hold more or less for other makes of pumps and for other sizes than the one on which the test was run. However, the further away we get from the same size of pump and from the same design of pump, the more remote we will be from a reliable calculation. One thing is clearly demonstrated by these tests, and the same thing will probably hold with other sizes of pumps; that is, the fact that the maximum horsepower as shown by a water test in the hydraulic laboratory will not be exceeded when the pump is handling stock irrespective of how high the consistency may be. In other words, if the motor is large enough to drive the pump against any head, high or low, when handling water, it will be large enough to drive the same pump when handling any kind of stock against any head. This fact may seem unreasonable, but when it is remembered that a heavier stock limits the capacity of the pump, it is easy to understand how it also affects the horsepower requirements. As an example of this, the pump tested at Kaukauna uses a maximum of 72 h. p. when delivering 3300 g. p. m. of water. The same pump required a maximum of 66 h. p. when delivering 2800 g. p. m. of 2.39 per cent stock, and it required only 62 h. p. to handle 4.38 per cent, but the capacity was reduced to 1800 g. p. m.

Selecting the Right Pump

Once having determined or estimated the head against which the pump operates, it is a simple matter to determine the horsepower required to drive the pump. The stock head is converted to the equivalent water head by taking a ratio between a water test and a paper stock test. The proper pump to deliver the required capacity against this corrected head is then selected. The size of the driver should be chosen to correspond to the maximum horsepower required by the pump when pumping water.

Perhaps, after all, the most practical way to plan a paper stock pumping installation is to compare the conditions with an installation that is already in operation. This may seem a little difficult to do, but a complete detailed record of between seventy and eighty installations will invariably reveal at least one or two installations which are quite close to the required conditions. The Wood pump which was originally designed for handling unscreened sewage is now being used in paper mills on practically every kind of work.

There are between seventy and eighty pumps giving satisfactory service over a wide range of conditions in the various parts of the country. Tests and reports on these pumps have indicated a large number of improvements and many suggestions have been sent in by various mill operators. The experences and suggestions have been compiled and a new design of paper stock pump is being brought out by Fairbanks, Morse & Co. to fit paper mill requirements more closely.

Operating Conditions Dictate Design Changes

Several improvements are being made in the impeller design, the casing, and the general mechanical construction. The casing is being split on an angle of 45 degrees so that it can be cleaned and inspected more quickly. Shutdowns in a paper mill are expensive, and if the top half of the casing can be quickly removed without disturbing pipe lines, repairs can be made in a fraction of the time required by many pumps that are in use.

The impeller will have a large number of blades, as we have found that the two-blade impeller has placed certain limitations on the diameter of the suction eye. This is required because each blade must be long enough to lap the one next to it and when such a length of blade is furnished, it has a tendency to reduce the diameter of the suction. On the new pumps, three and even a larger number of blades will be furnished as required. These are placed in such a manner as not to restrict the passages and yet they give a large size of opening to the suction so that a reducer in the suction line will no longer be necessary. Furthermore, the blade angle and other features are being designed in such a way as to give a higher efficiency and an even steeper characteristic curve. The discharge of the

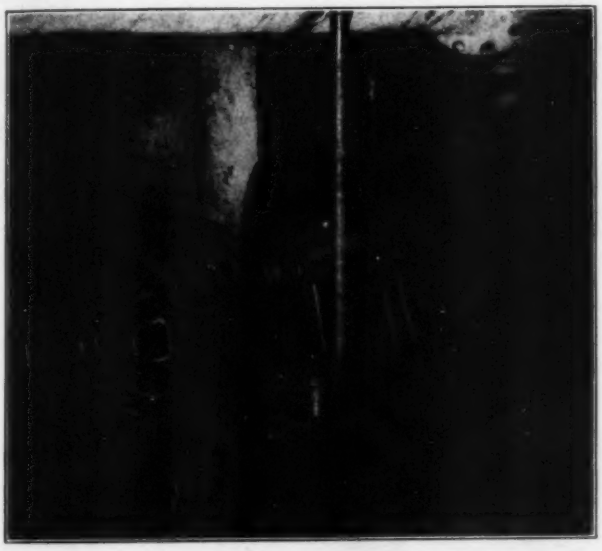


Fig. 6—6 in. Fairbanks-Morse paper stock pump at the Bogalusa Paper Company, Bogalusa, Louisiana. This pump handles 5.7 per cent stock

new pumps will be upward and the suction will be horizontal. This is the usual arrangement that is reqired by the average paper mill, and the object of this design is to be suitable for as large a number of conditions as possible. In the majority of mills, the pump is placed on the same level as the bottom of the stock chest, or it is placed immediately below the stock chest and the discharge is vertically upward to an upper floor.

Work Still to Be Done

There is still a great deal to learn about the power requirements for pumping paper stock. If we have done nothing more than to present the problem, without offering a solution, we have accomplished little. We hope we have contributed more than that. There is much yet to be found out in regard to the most economical size and kind of piping. There is much to be learned in regard to the friction caused by all kinds of paper stock in pipe lines. The power required by a pump is easily determined after all other conditions are known. The most important unknown factor is the friction of the material itself, and it is hoped that further research and development will offer enlightenment on this phase of the subject in the very near future.

A considerable amount of experimental work and observation of mill pump performance will be continually carried out by Fairbanks, Morse & Co., and companies in the paper industry. It is hoped that such co-operative work will result in the contribution of worthwhile engineering and operating data to the technical progress of the pulp and paper industry.

Pump Installation Statistics

Following are data showing the services and operating ratings of the Wood patent pumps of the Fairbanks, Morse & Co. installed in paper mills.

THREE-INCH PUMPS

Service	GPM	HD	HP.	Mill.
Lime Sludge	x	x	x	Northwest Paper Co., Cloquet, Minn.
White Water	400	40	x	Bogalusa Paper Co., Bogalusa, La.
White Water	400	40	x	Bogalusa Paper Co., Bogalusa, La.
White Water	400	40	x	Bogalusa Paper Co., Bogalusa, La.

FOUR-INCH PUMPS

Heavy Lime Sludge (25%)	500	30	10	Brown Paper Mill Co., Monroe, La.
Caustic Sludge (25%)	500	30	10	Brown Paper Mill Co., Monroe, La.
Thin Stock & Slivers	x	x	x	St. Lawrence Paper Mills Co.
Green Liquor	500	50	15	Brown Paper Mill Co., Monroe, La.
Green Liquor	500	50	15	Brown Paper Mill Co., Monroe, La.
Paper Stock (4)	250	40	15	Nashua River Paper Co., E. Pepperell, Mass.
Screen Rejects	100	10	10	Brown Paper Mill Co., Monroe, La.
Screen Rejects	100	100	10	Brown Paper Mill Co., Monroe, La.
XXX	550	40	15	Bogalusa Paper Co., Bogalusa, La.
XXX	550	40	15	Bogalusa Paper Co., Bogalusa, La.
XXX	550	40	15	Bogalusa Paper Co., Bogalusa, La.
Paper Stock (4%)	300	60	15	Tumwater Paper Co., Oregon.
Broke Stock (4%)	300	30	25	Tumwater Paper Co., Oregon.
Groundwood (3%)	xx	75	25	Occident Pulp & Paper Co., Edmonds, Wash.

FIVE-INCH PUMPS

Bagasse	x	x	x	Celotex Co., New Orleans, La.
Lumpy Stock (½%)	1000	32'	Belted	Rogers Paper Mfg. Co., South Manchester, Conn.
Paper Stock (4.5%)	400	75'	20	Champion International Paper Co., Lawrence, Mass.
Bagasse (4%)	500	93'	20	Bagasse Products Co., Tuinucu, Cuba.
Bagasse (4%)	500	93'	40	Bagasse Products Co., Tuinucu, Cuba.
Bagasse (4)	500	75'	Belted	New Haven Pulp & Board Co., New Haven, Conn.
Paper Stock (3%)	445	60'	30	Great Northern Paper Co., Millinocket, Me.
Paper Stock (2.7%)	435	54'	20	Great Northern Paper Co., Millinocket, Me.
White Water	1000	95'	35	New Haven Pulp & Board Co., New Haven, Conn.
Paper Stock (4.5%)	400	75'	20	Champion International Paper Co., Lawrence, Mass.
5% Unbleached Sulphite	470	50'	25	J. & J. Rogers Co., Au Sable Forks, N. Y.
Stuff Pump—(3%)	550	50'	20	Great Northern Paper Co., E. Millinocket, Me.
Stuff Pump—(3%)	550	50'	20	Great Northern Paper Co., E. Millinocket, Me.
Stuff Pump—(3%)	550	50'	20	Great Northern Paper Co., E. Millinocket, Me.
Stuff Pump—(3%)	550	50'	20	Great Northern Paper Co., E. Millinocket, Me.
Rag Stock (4%)	x	x	15	Neenah Paper Co., Neenah, Wis.
Paper Stock (4%)	205	42'	10	National Folding Box Co., New Haven, Conn.

SIX-INCH PUMPS

Service	GPM	HD.	HP.	
Kraft Stock (5.7%)	306	73	20	Bogalusa Paper Co., Bogalusa, La.
Paper Stock (3 to 4½%)	300	97	30	Brown Paper Mill Co., Monroe, La.
Cooked Straw	x	x	Belted	The Paraffine Co. Inc., San Francisco.
Paper Stock (3%)	1000	60	Belted	United Paperboard Co., Whippany, N. J.
Paper Stock (4%)	1400	20	20	Continental Paper Co., Bogota, N. J.
Paper Stock (5%)	232	70	20	Toronto Paper Mfg. Co., Toronto, Ohio.
Paper Stock (5%)	400	100	50	Bogalusa Paper Co., Bogalusa, La.
Paper Stock (5%)	1200	35	Belted	Byron Weston Co., Dalton, Mass.
Kraft Stock (5%)	900	60	50	Brown Paper Mill Co., Monroe, La.
Kraft Stock (5%)	600	40	30	Brown Paper Mill Co., Monroe, La.
Kraft Stock (5%)	600	40	30	Brown Paper Mill Co., Monroe, La.
Kraft Stock (5%)	600	40	30	Brown Paper Mill Co., Monroe, La.
Kraft Stock (5%)	300	50	30	Brown Paper Mill Co., Monroe, La.
Paper Stock (0.2%)	1500	60	40	Brown Paper Mill Co., Monroe, La.
Kraft Stock (5%)	600	60	50	Brown Paper Mill Co., Monroe, La.
Save-all	2250	15	x	Neenah Paper Co., Neenah, Wis.
Paper Stock (3%)	1200	40	30	United Paperboard Co., Urbana, Ohio.
No record	2100	31	50	Fletcher Paper Co., Alpena, Mich.
Paper Stock (3)	800	60	40	Bogalusa Paper Co., Bogalusa, La.
Six 6-inch Pumps	x	x	x	Brown Corp., Latuque, Que.
Paper Stock	400	69	30	Massasoit Mfg. Co., Oakdale, Conn.
Groundwood (3.2%)	20 Ton	100	75	International Paper Co., Three Rivers, Que.
Paper Stock (2.5%)	1000	61	50	APW Paper Co., Liberty Mills.
Paper Stock (2.5%)	1000	61	50	APW Paper Co., Liberty Mills.
Paper Stock (3.5%)	1000	32	20	APW Paper Co., Liberty Mills.
Paper Stock (3.5%)	1000	32	20	APW Paper Co., Liberty Mills.
Paper Stock (4%)	415	60	40	Michigan Carton Co., Battle Creek, Mich.

EIGHT-INCH PUMPS

Paper Stock (5¼%)	2400	60	75	Eddy Paper Co., Three Rivers, Mich.
Paper Stock (5%)	1500	40	40	Robert Gair Co., Montville, Conn.
Paper Stock (6%)	1500	45	75	Clifton Paper Mills, Clifton, N. J.

The Miami Valley Paper and Pulp Safety Conference, will be held at the Hotel Anthony Wayne, Hamilton, Ohio, Friday, March 16, 1928.

Beating with Rods

By SIDNEY D. WELLS

Paper Mill Laboratories, Quincy, Illinois

WIDE interest in the new and improved method of beating and refining has been displayed by paper manufacturers since the first announcement in 1926[1] of the application of the rod mill for beating and pulping. Since then there has been a score or more of installations for the purpose of pulping or beating a wide range of raw materials in the manufacture of as wide a range of products. In only one case has it failed and in the majority of cases the first installation has been quickly followed up by repeat orders. In the single case of failure, the cause was not one of principle but a mistake in the type of machine chosen for the kind of work desired. Since then more has been learned of the factors governing rod action in the beating of paper pulp and more particularly the operation of the Marcy rod mill which has had the habit of exceeding expectations in all the installations that have been made to date. On account of its unique design and heavy construction, this originator and pioneer in rod mill manufacture deserves special mention.

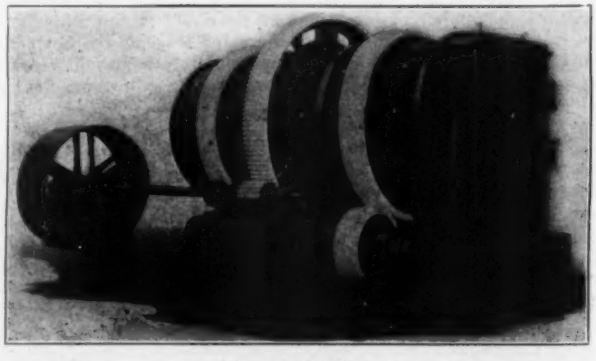
The most important factor in the beating of paper pulp by rods is the consistency of the stock, and the second factor, the regularity of the feed. These factors have been brought out in a recent paper by the writer.[2] While the strength factor is materially increased by working at a consistency of between 7½ and 8½ per cent, the uniformity of the beating is also increased, provided the stock is fed at a uniform rate. By the operation of the rod mill at a consistencies above 5 or 6 per cent, there is parctically no pool at the foot of the pile of rods in the mill. At lower consistencies a large pool exists which in the case of mills with small trunnion outlets, is almost as deep as the internal radius of the mill. Under such circumstances, there is more stock in the pool at the foot of the rods than there is between the rods themselves and it is practically impossible to obtain uniform beating. With the elimination of the pool by working at stock consistencies above 5 or 6 per cent, as is possible only with the Marcy rod mill, there is no chance for the stock to escape the action of the rods by passage from the inlet to the outlet of the mill through the pool instead of between the rods. It is possible to observe in any mill working at low consistencies the passage of stock through the pool. Batches of oil may often be seen on the surface of the pool passing from the inlet to the outlet without being seriously disturbed by the rod action.

The uniformity of the treatment given to individual fibers when operating at low consistency in displacement types of rod mills is shown by the fact that they will beat twice as effectively when operating on batches at consistencies of five per cent or above compared to what they will do when operating continuously at the low consistencies on which they must work if proper flow is maintained. With the Marcy rod mill, it is possible to open the door at the outlet at any time when the mill is in operation and observe exactly what is taking place. By so doing, the operation of the mills so far installed have been maintained at the proper point to obtain most effective rod action and uniform results. Another advantage of high consistencies is a very marked reduction in the noise of the rods by the cushioning effect of the thick stock. When operating at consistencies of 8 per cent, it is possible to hear conversation in the vicinity of the mill without raising the voice. This is impossible when working at lower consistencies and is one of the objections to some of the installations of the rod mill most frequently expressed. The reduction in noise by working at high consistencies in the Marcy rod mill is further increased by the use of a door and splash plate at the outlet which serves to confine any noise that may occur. The cushioning effect of the stock at high consistencies not only reduces the wear on the rods and lining but, by the reduction of wear, discoloration is very remarkably reduced. Where even slight discoloration is objectionable, however, it is advisable to use either stainless steel or manganese silicon bronze lining and rods.

Saving in Power

In the article referred to above, it is stated that a saving of from 50 to 70 per cent of the power required by beaters can be effected by the use of the rod mill. Installations since then have further confirmed that statement and experimental work explained it. Work at the U. S. Forest Products Laboratory has shown that a 20 minute treatment of kraft pulp in a 3′ x 5′ rod mill shortened the time required to develop maximum strength tests in the standard pebble mill by one hour. Furthermore the maximum tests capable of being developed by the pebble mill were increased by 4 per cent. Observations of tests made by a 5′ x 10′ Marcy rod mill have demonstrated that it is capable of imparting to 17 tons of pulp per day a beating treament 20 per cent greater than that imparted in 20 minutes in the 3′x5′ mill. This would indicate that a 5′ x 10′ mill would be capable of treating 20 tons of pulp to the same degree as a 20 minute treament in the 3′ x 5′ mill. The largest size of Marcy rod mill made at the present time is 7′ x 15′. On this basis such a mill is capable of treating 55 tons of pulp to the same degree with only 160 horse power required for operation. These figures are unbelievable but experiments and performances have shown that they are true.

In the development of the felting properties of paper making fiber, the phenomenon known as hydration is invariably an accompaniment. In the use of short fibered pulp, whatever hydration occurs is of benefit to the paper because, at most, only a very short beating treatment is given. In the treatment of long fibered pulp, however, such as sulphite and sulphate pulps, cotton rags, manila, jute, linen, etc., large amounts of beating are necessary to develope proper felting properties in the manufacture of the tough and strong papers for which these fibers are demanded. Such prolonged beating invariably produces more hydration than is desired and the removal of the water of formation in the subsequent paper making operation at the suction boxes, couch roll, presses, etc., is very much retarded. The sheet, consequently, contains more water than it otherwise would and the capacity of the dryers is very much reduced. In addition to the reduced production encountered, the quality of the product is often impaired by excessive stiffness, dullness in appearance and in some cases brittleness. The time the stock has been slop-



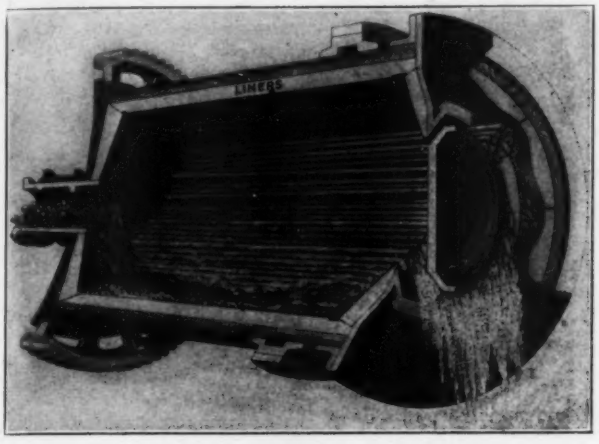
Marcy Rod Mill

ping around in the system to develope the proper felting properties has produced excessive hydration. On the other hand, if the beating tackle is sharper and is lowered too rapidly, the strength of the resultant product is sacrificed by too drastic cutting of the fibers. With the use of the Hollander type of beater in conjunction with refining engines the paper manufacturer has been between the horns of the dilemma. The rod mill offers to him the solution of his troubles. By the passage of 25 tons of pulp through a 7′ x 15′ Marcy rod mill in 24 hours, a beating action is obtained equivalent to that given in the standard types of Hollander beaters in from 7 to 8 hours. In the rod mill there is no danger of cutting the fiber even though the time taken in passage through

1. Rod mill in the Pulp & Paper Industry by John D. Rue and Sidney D. Wells, Published in Paper Trade Journal, September 16, 1926.
2. The Marcy rod mill in the Paper Industry by Sidney D. Wells, Paper Trade Journal, October 27, 1927.

the mill at the rate stated above would be only about 20 minutes. Freeness tests have demonstrated that the rod mill develops maximum strengths with two to three times the freshness of stock developed to equal strengths in the beater. The maximum felting properties are developed and at the same time a stock is produced which will permit the easiest removal of water and maximum production on the paper machine.

An interesting application of the rod mill is in the manufacture of glassine or greaseproof papers. The stock prepared for these papers is hydrated to an extreme degree and enormous amounts of power are required. The use of the rod mill with stock at low consistency has produced rather indifferent results in this field on account of the ununiform results caused



Interior view of Marcy Rod Mill

by certain portions of the stock escaping rod action by passing through the pool at the foot of the rod pile. By the use of proper consistency, as can only be done in the Marcy rod mill, excellent results are obtained with great saving in power. Not only is the parchment effect produced with from 50 per cent to 75 per cent less power, but the fibrous character of the pulp has not been so completely destroyed and the paper is not so brittle as when made in the Hollander.

Not only is the Marcy rod mill a very effective instrument for the beating of paper pulp, but it is also especially efficient as a pulping agent in the conversion of wood pulp screenings to paper pulp or the pulping of semi-cooked chips, from wood waste or other sources, straw, cornstalks, rags, cottonseed hulls, etc., in the manufacture of paper products. While the Marcy rod mill is more adaptable to this type of work than any other type of machine now available we will not take the time now to discuss it further. For those who care to look into the subject further, the U. S. patent[3] granted to cover the application of the rod mill to the pulping and beating of paper stock will be of interest.

The inquiry is often made as to what is the expense of mechanical upkeep in the operation of the rod mill and how does it compare with beaters and jordans. The forces involved are very great and the shocks occur continuously. When rod mills were first introduced in the mining field it was not realized how heavily and perfectly they must be built and their life was exceedingly short. Each new unit was built heavier than its predecessor but it was years before mills were built that were reasonably rugged. Mr. F. C. Marcy a prominent mining engineer, was the first to realize the necessity for extremely rugged construction and, as the result, the Marcy rod mill, which is now accepted as the ultimate in this field, appeared. Manufacturers who have not had any contact with these early developments have recently commenced the manufacture of rod mills to take advantage of the interest manifest in the paper industry. Many of these mills are much too light for satisfactory service and are suffering the same failures encountered in the early days of rod mill development. The wear on the rods in a Marcy rod mill, five feet in diameter, when operated on stock at proper consistency, can be compensated by opening the door at the end, a matter of a few minutes, and throwing in one three inch rod every two or three months. The linings are replacable and replacement will be necessary only once every three or four years. The gears are cut steel gears and can be turned around when one side is worn. They will last many years unless injured by accident or negligence. The rest of the mill should last indefinitely. It is, consequently, evident that the upkeep on Marcy rod mills is very much less than on beaters or jordans. In the mining industry, where the wear from abrasion is obviously more severe, Marcy rod mills frequently show 98 and 98½ per cent operation seven days in the week and 24 hours per day.

Summary

1—The Marcy rod mill is capable of handling stock at any rate and at any consistency which can be furnished from deckers or thickeners.

2—At 8 per cent consistency the Marcy rod mill will beat stock with from 50 to 70 per cent less power than is at present used by beaters of the Hollander Type.

3—The Marcy rod mill will develop greater strength from standard pulps than any other equipment known at present.

4—The Marcy rod mill will yield freer stock capable of producing paper of any specified test on account of most rapidly developing felting properties.

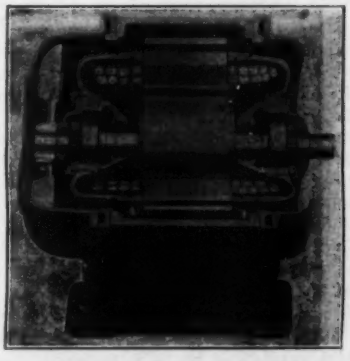
5—The Marcy rod mill will develop the parchment effect with less brittleness, destruction of fiber and loss of strength and toughness than any other equipment now used.

6—The Marcy rod mill will operate seven days in the week for twenty-four hours per day for years with less than 2 per cent lost time for repairs.

New Totally Enclosed Motor

A new type of completely enclosed ventilated motor with a 40 degree rating, has been perfected by the American Electric Motor Co. of Cedarburg, Wis., which company recently became a subsidiary of the Splitdorg-Bethlehem Electrical Co.

The new P. K. American motor is totally enclosed, self ventilated, absolutely dirt and moisture proof and requires no ventilating pipes. The enclosed hoods hermetically seal the winding. The hoods are telescoped into a ring fastened to the stator laminations, the surfaces of which are machined. Cooling of this motor is unusual in that air is driven through as well as over the stator laminations. The stator core is perforated, thereby making it possible to remove the heat at the point where it originates. Air in the enclosed portion is agitated by malleable cast fans shrunk on the motor shaft.



The ball bearings are of the cage type. The enclosing hood of the motor can be removed without disturbing the bearing, which remains on its shaft enclosed in its cage. No dust or grit can get into the bearing. The stator is removable and if damaged can be replaced in a few minutes by any mechanic. The rotor is of the usual construction with the exception of its winding. The end rings are electrically welded to the bars forming an indestructible one-piece squirrel cage of uniform material.

Allis-Chalmers Manufacturing Co., Milwaukee, announces that E. D. Hill will be located at 42 Church St., New Haven, Conn. This will enable the company to more effectively serve that section in connection with motors, pumps and Texrope drives. Sales will be under the direction of A. F. Rolf, manager of the company's New York office.

Catalogues, Books & Publications

H. W. Caldwell & Son, Chicago—A very attractive 85-page catalogue, No. 989, is devoted entirely to screw conveyor, fittings, and accessories, covering both the Caldwell Helicoid and Sectional Flight types. Tables of dimensions annd price lists are given, also charts, figures and numerous illustrations.

Chisholm-Moore Mfg. Co., Cleveland, O.—Bulletin No. 31 is one of a series of Material Handling Equipment bulletins being prepared and published by this company. There is a short treatise on the importance of electric hoists in industry, the various types of hoists, their use, operation and care is well covered, and exceptionally complete diagrams and tables of clearances, dimensions and other data are given.

Edge Moore Iron Co., Edge Moor, Dela.—A very attractive catalogue, No. 65, has been issued by this company, entitled "The Edge Moore Cross Drum Boiler." There is a general description of the different parts of the boiler, and each step in the process of manufacture is explained. The catalogue is profusely illustrated. Cross section figures, together with suggested plans for a boiler room are given. A section giving rules for the care of Edge Moor boilers, published with the permission of the Boiler Code Committee of the American Society of Mechanical Engineers is also incorporated.

The International Nickel Co., New York, N. Y.—A Buyers' Guide covering monel metal and pure Nickel Products has been compiled by this company. Each product is indexed followed by a list of distributors.

Lawrence Pump & Engine Co., Lawrence, Mass.—The Lawrence Vortex Single Stage, Single Suction Heavy Duty Stock Pump is described in Bulletin D-30. Illustrations and sectional figures are shown of the type O. S. P. Single Suction, Open Impeller, Split Casing Pumps, representing the latest development in the design of pumps for handling pulp and thick stock in paper and pulp mills.

Metropolitan Life Insurance Co., New York—Report No. 53, "Paying Employees by Check" gives facts furnished by 50 firms which were consulted as to the advantages and disadvantages found in paying employees by check, in a recent survey conducted by the Policyholders Service Bureau. Copy upon request.

Morse Chain Co., Ithaca, N. Y.—This company has issued a handbook on silent chain drives that treats thoroughly the subject of silent chain power transmission. Complete instructions are given on how to design silent chain drives, followed by an example of an actual design. A list of typical drives is given to assist engineers, and there are tables, price lists and instructions as to installation, care and operation. The book is a complete and ready reference for solving most any power transmission problem.

Revolvator Co., Jersey City, N. J.—Bulletin No. 81 which is taken from the company's general catalogue, describes briefly Revolvator material handling equipment. Illustrations of the Revolvator piling material in many different factories are shown. Copies sent upon request.

Rollway Bearing Co., Inc., Syracuse, N. Y.—A very attractive catalogue, No. 4-A describes and illustrates the Rollway Cylindrical Roller Bearings made by this company. Listed under the different types of bearings are tables giving rated capacities in pounds per inch of bearing length and length of space required for bearing. Tolerances and typical layouts are shown, also a description of the Rollway Utility Bearings.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—Publication of the 1928-1930 catalogue of electrical supplies has just been announced. This catalogue presents the electrical and mechanical features and application information for all supply apparatus and appliances manufactured by this company, and also describes and illustrates a representative list of large motor and generating apparatus.

The Morse Chain Co., Ithaca, N. Y., has appointed T. M. Manley manager of the district including the Mohawk Valley, Northern New York, Vermont, Western Massachusetts and Northeastern Pennsylvania, with headquarters at Ithaca. Mr. Manley has served the company in various capacities for about 20 years.

Mead Inter-Allied Safety Contest

Supplementing its activity in The Paper Industry Safety Contest, The Mead Pulp and Paper Co., Chillicothe, Ohio, has given added impetus to Safety study and practice by engaging its nine mills in an inter-allied safety contest.

This contest was in force only nine months of 1927, but a vast improvement was shown by each of the mills. The handsome trophy illustrated was offered by G. H. Mead, president of the company, and was won by the Chillicothe mill. This mill's score on severity was .161, frequency, 9.42. These figures were based on a total average number of

employees, 678; number of accidents, 13; days lost, 223. The final average total for all mills showed 3476 employees, 245 accidents, 3327 days lost; giving a frequency rate of 35.59 and severity rate of .483.

The Mead mills are engaged in a similar contest for 1928, using rules which have been patterned after those used for The Paper Industry Safety Contest. Special mention is due the company's safety director, Ernest Augustus, under whose efficient direction this work is being carried on.

Two of the Mead mills won certificates of merit in The Paper Industry 1927 Safety Contest, and with such unified effort toward accident prevention, it is not unlikely they will make a far greater showing in 1928.

United Conveyor Corporation Announcement

United Conveyor Corp. has purchased from Conveyors Corporation of America the good will, and all patterns, patents, designs and manufacturing rights for the American Steam Jet Ash Conveyor, the American Cast Iron Storage Tank and American Air Tight Doors, and the Steam Jet Ash Conveyor business of its predecessors, American Steam Conveyor Corp., Green Engineering Co., Girtanner-Daviess Co., Griffin Engineering Co.

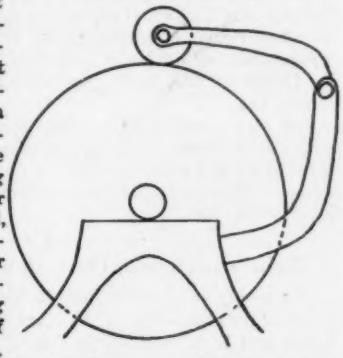
From this wide range of design and equipment the United Conveyor Corp. is enabled to select the type of system fitted best to the special requirements of the plant. This company is now by far the largest in its field which has made it possible to secure very competent engineering and production forces. They stand ready to serve promptly and intelligently all former customers of all the companies which have been taken over.

The first advance resulting from the Swedish pulp mill suspension occurred this week when a New England pulp maker quoted 4 cents on spot business, retaining 3.75 cents on contracts, for a well-known brand of bleached sulphite of book grade. Pacific Coast bleached sulphite shipped via intercoastal lines to Boston is being offered at 3.40 cents and 3.70 cents for book and writing brands respectively, c.i.f. docks, Boston.

Practical Helps for the Mill Man

A Dryer Take-Up Roll

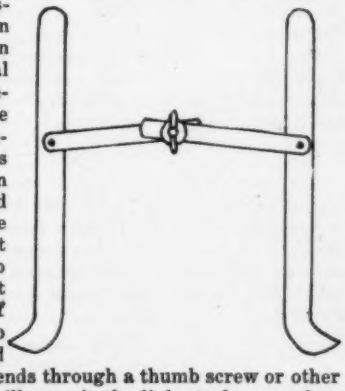
THE drying of paper on a multi-cylinder board machine is frequently accomplished with the dryers equipped only with a lower dryer felt. In other instances, no felt may be used. To prevent any difficulty in the handling of sheet on such a machine one operator, at least, has found it of advantage to make use of a take-up roll. Two take-up rolls are in use on the machine, one roll being located on the last upper dryer toward the dry end, and the other being located on an upper dryer near the center of the section, both rolls extending across the full length of their respective dryer face.



Such a roll is supported through an arrangement of arms as illustrated, which are in turn attached to dryer frame. This arrangement permits a take-up roll to be raised from the dryer face with comparative ease. The use of the two rolls gives easier control over the entire dryer section and have been found of great help in the handling of the machine.

A Simple Maintenance Tool

FREQUENTLY, in maintenance work about the plant, it is of advantage to scrape the threads of nuts, pipe couplings, etc. As the threads are on the inside of these fittings it is not always easy to satisfactorily perform such an operation. A tool that can be made from flat metal strips by any handy mechanic is shown in the illustration. The measurements for the various parts of such a tool can be easily approximated from the nature of the work it might be most frequently called upon to do. As illustrated, a short link is attached to each of the two arms, and the two links in turn are joined together at their opposite ends through a thumb screw or other convenient device which will permit the links to be moved or locked in any desired position. To use the instrument it is simply necessary to loosen the screw and to place the parallel arms in the fitting to be cleaned and then locking the screw with the points of the arms entering the threads tightly. This puts the tool in position for performing the cleaning operation which is done by simply revolving the tool about the fitting or vice versa.



Horsepower of Shafting

THE power which commercial steel shafting should be expected to transmit varies greatly with the operating conditions. Shafting of ample size should always be installed, and there should always be sufficient excess capacity to provide for unexpected overloads or for later additions to the equipment.

A number of formulas have been developed for the determination of the horsepower that might be safely transmitted by shafting. Three approximate formulas for turned steel shafting that are widely used are based upon the diameter of the shaft in inches, and the revolutions of the shaft per minute. These three rules are as follows:

$$(1)\ \text{H. P.} = \frac{D^3 R}{125} \qquad (2)\ \text{H. P.} = \frac{D^3 R}{75} \qquad (3)\ \text{H. P.} = \frac{D^3 R}{50}$$

H. P.—horsepower D—diameter of shaft in inches R—revolutions per minute.

The first formula is used when making calculations for head shafts or shafts subjected to heavy strains, shafts for gear installations, etc. The second formula is used for line shaft calculations when bearings are commonly located every eight feet. The last or third formula is employed for simple power transmitting problems where the shafting is subjected to no bending strains.

The Bristol Type B-K Valve

The Bristol Company, Waterbury, Conn. is now introducing an electric motor operated valve for steam, water and compressed air. This differs from the earlier types in several features, the principal being its unusually rugged construction, its high ratio between motor and valve speeds, and the provision which has been made for keeping the high temperatures of steam lines away from the motor and operating mechanism.

The illustration shows that a heavy globe valve body of standard design is employed, and that the operating unit is supported well clear of it on a rigid bracket of such design as to eliminate the possibility of lost motion between the gear train and the valve stem. The valve is operated by a cam, acting on a follower directly in the line of the stem and tending to force it to the open position. All gearing is contained and totally enclosed within a substantial cylindrical cast metal gear box.

The motor is of a standard make, and is carried upon one end of the gear box by a waterproof mounting, the arrangement being such that the shaft of the motor is directly in line with the cam shaft. The power consumption of the motor is about 25 watts; and the time of opening or closing the valve approximates twelve seconds.

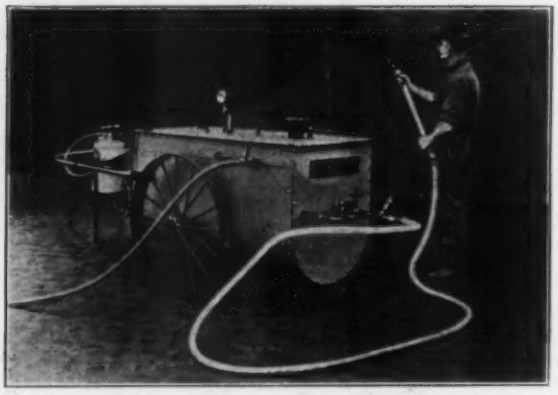
In a readily accessible compartment within the end of the gear box remote from the motor, is mounted a limit switch whose function is to clear the motor circuit when the operation of opening or closing the valve is completed. The switch is actuated by a small cam carried on the main cam shaft, and is thus positively interlocked with the valve. The switch parts are constructed of heavy phosphor bronze strip with massive tungsten contacts; and the whole is mounted as a unit within a moulded bakelite casing. All wiring between the switch and the motor is enclosed in flexible armored conduit; and provision is also made for attaching directly to the body of the gear box the conduit which carries the conductors from the control switch.

D. U. Murphy, founder of the LaCrosse Paper Box Co., La Crosse, Wis., died at his home in that city recently.

Quigley Bitumen Gun

It is a well known fact that the mop-and-pail method of applying hot tar, asphalt, pitches, enamels, heavy fluids, waxes, paraffines and similar materials, as a protective coating, has always been slow, expensive and unsatisfactory. The work has required a large number of men to carry the heated material by the slow method from melting pot to the job, where it has been smeared on with mops or brushes or poured.

The Quigley Furnace Specialties Co., New York, has developed a new machine which sprays or shoots liquids of practically any consistency or temperature through special



Applying coating to concrete wall

insulated, metallic hose, any distance up to several hundred feet from the gun. Volume and pressure are under easy control, assuring uniform coverage, regardless of atmospheric temperature.

The economies effected by the Quigley Gun are remarkable. On a big penstock job, two men covered more surface than twelve could cover in the same time using the mop and sprinkling can method, and the work was done better. The spray penetrated every crack and crevice, reaching places

Applying protective coating to penstock

difficult, if not impossible, to reach otherwise. The gun covered more than 60 square feet in 20 seconds. Five gallons were sprayed in one minute, covering approximately 125 square feet.

Penetration and adhesion also depend largely on the speed and heat of the spray. As both are under constant control, practically perfect coverage is assured, and overheating to make up for delays in reaching the job at the proper temperature is not necessary.

So great are the savings made by this gun that it will frequently pay for itself on a single job. Ability to control the temperature and thickness of coating makes compliance with the most exacting specifications easy, and permits close estimating of material and time.

Compressed air is never in contact with the material in the gun, nor is it used to form the spray. Atomization is obtained by a purely mechanical process. Air is not entrapped in the material, which retains all its original and valuable properties, required for penetration and adhesion to the surface.

Fifteen cubic feet of air a minute at 60 pounds pressure is sufficient to operate the gun. A small portable garage compressor, operated by either gasoline or electricity will answer where no air supply is available.

The Quigley Bitumen Gun is an adaptation of the patented Quigley Refractory Gun, which has been highly successful in other fields, hundreds being in use for shooting plastic refractories, or concrete mixtures, and in building or repairing furnace walls, baffles, concrete structures, stuccoing, plastering, etc.

The gun consists of a cast iron cylinder from which the material is forced by a piston capable of high pressure, and is enclosed in a steel housing, mounted on wheels. Its capacity is 15 gallons, enough to cover approximately 400 square feet of surface.

Bahr Purchases Hart Paper Company Plant

The newly organized Bahr Refiners Paper Corp., Marion, Ind. has purchased the T. F. Hart Co.'s plant at Albany, Ind., which has been inactive for some time. This company will manufacture, buy, sell and deal in paper products, box boards, and similar merchandise.

The new company is incorporated for $50,000, and the incorporators are A. F. Bahr, O. B. Bahr, W. F. Bahr, Chas. A. Bahr and Sam W. Bahr. The old plant was formerly operated by T. F. Hart, a Muncie manufacturer.

Jacobson to Install Northwest Paper Digesters

Jacobson Engineering Co., consulting engineers of Minneapolis, have been engaged by the Northwest Paper Co., Cloquet, Minn. to prepare plans and supervise the installation of two new digesters. Space will be prepared for a third digester.

The new building to house the digesters will be an extension to the present soda mill. The digesters, each 12 ft. in diameter by 35 ft. 6 in. in length, were recently purchased from the Manitowoc Engineering Works. Building operations have already commenced.

The Southeastern Division of the American Pulp and Paper Mill Superintendents Association will meet Friday and Saturday, March 16 and 17, 1928, at Lynchburg and Big Island, Va. Interesting papers are being prepared, and on Saturday there will be an inspection of the Bedford Pulp and Paper Company's properties at Big Island, and a drive up the valley to Natural Bridge.

General Electric Co. Men Honored

Professor Elihu Thomson, director of the Thomson research laboratory of the General Electric Co., has been named a member of the American committee of the World Congress of Engineers to be held in Tokio, Japan, in November, 1929. The appointment was made by Secretary of Commerce, Herbert Hoover. This is the first congress of its kind ever held and according to Baron K. Furuichi, president of the Engineering Society of Japan, is for the purpose of promoting international co-operation in the study of engineering science and problems in all its branches and stimulating a sense of brotherhood among the engineers of the world.

Dr. E. F. W. Alexanderson, consulting engineer of the General Electric Co. and Radio Corp. of America, was presented the John Ericsson medal at the 40th anniversary banquet of the American Society of Swedish Engineers in New York, February 11. The award was given Dr. Alexanderson "for his outstanding contributions to the field of radio engineering."

Fifty-First Annual Convention of the American Paper and Pulp Association

Large Gathering Attends Meetings and Hears Need Discussed for New Form of Organization

THIS year's meeting of the American Paper and Pulp Association and affiliated associations was remarkable both for attendance and the keen interest taken in the proceedings. A departure was made from the custom of previous meetings, in that the general association convened on the first day of meeting instead of on the fourth day as heretofore. This resulted in one of the largest gatherings of paper manufacturers, executive and specialists in the various branches that has ever come together at a general meeting of the association.

The interest in the character of certain changes that had been proposed in the form of organization of the association also served to bring out a large attendance. The development of separate associations which operate more or less independently in the same field as the parent association has occasioned a certain duplication of effort concurrent with new activities. Thus all of the separate groups or associations do not rely on the central organization for the collection of statistics and its work accordingly has in many instances been anticipated and rendered unnecessary, and while some excellent accomplishments lie to the credit of the association, complaint is made occasionally concerning the extra financing made necessary by what is considered by many an avoidable doubling of overhead expenses.

Under the existing form of organization of the American Paper and Pulp Association, difficulty is experienced in aligning the several affiliated and allied associations for the achievement of definite aims and purposes affecting the industry as a whole. With a definite allocation of work and cooperative effort between the general association and the affiliated organizations, the situation might, as President Everest pointed out, be improved and strengthened. In considering ways and means of strengthening the association, one proposal discussed was that all operating groups, affiliated associations, etc., be made an integral part of the general association under a single director; it was felt, however, that objection might be made to such an arrangement by certain of the older and better organized groups who would hesitate about allowing less well organized bodies to be placed on the same footing with themselves.

President D. Clark Everest

Re-elected president of the American Paper and Pulp Association, February 21, 1928.

The most feasible suggestion or proposal was concerned with the formation of a Paper Institute along the lines of other industries, particularly the Steel, Copper, Iron and Rubber Institutes. The suggestion was contained in President Everest's annual address, who said he was uncertain whether such an organization should confine itself only to general problems of the industry and extend its work through the organization of unorganized groups, or become a unified organization with one general manager, the several associations in committees to serve as departments of the proposed Paper Institute.

This whole problem of reorganization is to be studied during the coming year by a special committee of five members, action to this end having been taken through the adoption of a resolution proposed by former president Norman W. Wilson which provided that this committee make its report to the executive committee of the association which will then call a special meeting of the members in the fall, or bring the matter up for action at the regular annual meeting next year. In the meantime, the association will function under the existing form of organization.

The retirement of Dr. Hugh P. Baker as executive secretary of the association was made the occasion for several expressions of appreciation by officers and members, the climax being reached at the annual banquet on Thursday evening when he was made the recipient of a handsome silver service in recognition of services to the association during his term of office.

With the exception of the office of secretary-treasurer, which is now in charge of Oliver M. Porter, who served as assistant secretary during Doctor Baker's incumbency, no change was made in the official family of the association, President D. Clarke Everest being reelected to serve for another term, as also the two vice-presidents and the entire executive committee.

Proceedings in Detail

President Everest opened the fifty-first annual meeting of the association at 10:45 o'clock on Tuesday morning, February 21, by calling for the minutes of the last annual meeting, which on motion were taken as read, after he had called attention to a careful analysis of the work of the association

during the past year which had been made in a special annual report of Executive Secretary Hugh P. Baker, copies of which had been distributed to all present. This consisted of a 48-page pamphlet containing a comprehensive review of the work of the association since its organization down to the present time. Beginning with current association activities, Dr. Baker's report was as follows:

Report of Executive Secretary Hugh P. Baker 1927-1928

THERE has never been a time in the years of development of American industry when there has been greater necessity than there is today for industry to make itself vocal in the economic and political life of the nation and it is particularly important that as industry speaks for itself it shall speak with the force of a single voice. There is no way by which an industry, such as the paper and pulp industry, can present a united front in all of the complex problems which are pressing in from the outside, or by which it can speak as a unit, than through the trade association. The very fact that this association has had continuous existence for 51 years indicates the belief of a large part of the industry that it must have a means of expressing itself in all matters affecting the industry as a whole, whether it be the protection of the industry through a reasonable tariff, the policing of the tariff law, the perpetuation of its supply of raw materials, or in such matters as taxation, freight rates, stream improvement, etc.

While the association does not yet speak for every group within the industry and while it may mean years of aggressive educational effort before all of the various groups in the industry unite as a single force behind the association, yet there can be no question but that the increasing complexity of economic problems with which the industry is faced and the increasing competition in the domestic and foreign markets, will force the industry to come together and stand solidly back of the one agency which is representing the industry today, that is, the American Paper and Pulp Association.

Consistently, during the past eight years, the officers and staff of the association have hammered at the fact that the association is the only agency within the industry which could speak for the industry in any of the increasingly important outside contacts with other industries, with government, and with the public. This has resulted in giving the association prestige, as the mouthpiece of the industry, that it has never enjoyed before. This ground must be held and further advances made and there is every indication that under the wise direction of the leaders of the industry great advance will be made in the next few years. Never again will the industry go through the humiliating experience which it went through several years ago in Washington when the chairman of an important congressional committee told a group representing different elements of the industry to go out in the hall and settle their own differences and then come back and tell the committee what the industry needed as an industry.

Statistical Service

During the past year the statistical service of the association, under the direction of Paul S. Hanway, has been functioning as a thoroughly effective service bureau. Statistics on pulp and paper, outside of the current statistical activities of the Writing, Cover and Tissue Associations, the Wrapping Paper Manufacturers Service Bureau, and the News Print Service Bureau, were found to be in a rather chaotic condition. It has been the work of the statistical department during the past year to bring order out of chaos through developing sound sources of information and by properly segregating and organizing the statistics covering various grades of pulp and paper. During the year two series of graphic charts covering pulpwood, pulp and paper, have been produced and sent to the members of the association. These graphic charts are a background for future statistical work in the industry.

The statistical service has received splendid help in coordinating and bringing together basic statistics from the U. S. Forest Service and the Bureau of the Census at Washington. It has had the fullest co-operation from affiliated associations and from the Paper Board Industries Association and the Southern Kraft Manufacturers Association, organizations not affiliated with this association.

Another outstanding accomplishment of the statistical service during the past year has been the much needed revision of the census schedules covering pulpwood, pulp and paper. It has been appreciated for some time that the census schedules were not in the form to give information of the greatest value to the industry. While the association has had this matter up with the Bureau of the Census in years past, it has never been able until the past year to accomplish results desired and that largely because it did not have a trained statistician to make a thorough study of the whole census situation as affecting paper. Without such study it was impossible to bring the industry into reasonable agreement as to the changes desired.

Early in the year the association brought into existence a Committee on Statistics and it was particularly fortunate in securing the help of C. B. Morgan of the S. D. Warren Company as chairman of this committee. Two regular meetings of the committee were held and these were largely attended by representatives from affiliated associations, from the Paper Board Industries Association and the Southern Kraft Manufacturers Association, and by representatives of the Bureau of the Census. It is very fitting that the association should record the most sympathetic co-operation from Director Steuart and his associates in the Bureau of the Census.

Following meetings of the committee Mr. Hanway did special work with association representatives in Springfield, Boston, Chicago and Washington, and finally almost unanimous agreement in the proposed changes was secured from organizations within the industry. These were accepted by the Bureau of the Census and the Biennial Census of 1927 will be based upon these revised schedules. In view of the fine way in which the Bureau of the Census has accepted almost complete revision of the census schedules for the pulp and paper industry we feel strongly that it would be decidedly to the advantage of the industry for individual mills to co-operate fully with the Bureau of the Census in the careful filling out of the schedules and their prompt return to the bureau.

Accurate and complete statistical reports are the most valuable guide posts to the manufacturer of today in determining trends of business and in satisfying himself as to the relation of his operations to the industry as a whole. Even with the progress that has been made there is much to be accomplished. Great improvement could be made in statistics covering pulpwood and pulp and it is hoped that the association will not lessen in any way the effectiveness of its statistical service but that it will make the necessary effort during the coming year to develop more complete and accurate statistics on pulpwood, pulp and secondary raw materials used in the industry.

A phase of the work of the statistical service which has met with fine response is the issuance of the Weekly Business Review. Even though the development of this publication has been most carefully supervised by the secretary and the assistant secretary, yet the credit for the publication is due largely to Mr. Hanway. The many letters which have been received throughout the year as to special articles and reports in the Review indicate that it is being used by the industry and that it is filling a definite need.

The Review, soon after it came out in printed form, was sent to a large number of banks through the country and many complimentary letters were received. This led to a decision to sell the Review to those outside of the industry who might wish to subscribe and a number of subscriptions have been received. The association has felt justified in putting the Review on a subscription basis to assist in the payment of preparation and printing.

Direct service along statistical lines has been found to be an important phase of the work of the statistical service. Scarcely a day passes when telegrams and letters or people do not come in to secure statistical information as to the industry. While this involves constant investigation it has been mutually advantageous as between the association and

its membership in that it has caused the statistical service to develop files of information of inestimable value.

All of the work of the statistical service has been done without thought of supplanting in any way the statistical service carried on by affiliated associations but rather to supplement and assist in the work of the other associations. There is no affiliated association that covers in any way the entire industry so that the statistical service of the American Paper and Pulp Association is fundamental in giving the entire industry the information which it should have all the way along the line, from raw materials to the market.

An Engineer in the Industry

One of the first contacts which the secretary had with Washington after coming into the association in 1920 was in connection with a drastic stream pollution bill introduced in the House by Representative Appleby of New Jersey. In cooperation with representatives of other industries which discharge waste into rivers and streams this bill was opposed and its passage prevented and that because if passed it would have been confiscatory in character. This led to an investigation of the stream pollution situation in the industry. Inquiries were sent to a number of national scientific organizations and governmental departments and with the apparent importance of the subject it was surprising to find out how little was known as to the effect of the discharge of various forms of wastes into streams and rivers.

Gradually during the past eight years, stream improvement laws have been passed in various states and in a number of instances the association has been able to assist in modifying these laws and in bringing about a better understanding of their application. The growing menace of confiscatory stream pollution legislation in the states and in Congress emphasized the necessity of the industry attacking the problem for itself and in so far as possible solving it in such a way as to not only meet with the requirements of legislation but that waste might be saved to the financial benefit of the mills.

The Technical Association of the Pulp and Paper Industry, which has been very aggressive during the past few years in meeting technical problems with which the industry is confronted, several years ago appointed a Committee on Waste Disposal. Two years ago, after this committee had made a report to the Technical Association, a discussion of the report brought out the fact that the problem is industry-wide and is of so much importance that it should be met by an organization more representative of the entire industry than even the Technical Association. Therefore, a resolution was passed by the Technical Association calling upon the American Paper and Pulp Association to act for the entire industry. On the basis of this resolution by the Technical Association, a resolution was passed at the 49th annual meeting of the American Paper and Pulp Association which authorized the president to appoint a committee to make an investigation of the situation and prepare recommendation. In the spring of 1926, Norman W. Wilson, then president, appointed the National Stream Purification Committee of the Pulp and Paper Industry. This committee met in Chicago in June, 1926 with very full attendance, including representatives from engineering departments of several of the States most concerned. The committee finally recommended that the only way in which the problem could be met effectively would be for the American Paper and Pulp Association to employ a trained engineer. As the association did not have funds available for an engineer, a sub-committee on finance was appointed and this sub-committee, under the leadership of H. E. Fletcher, of the Fletcher Paper Company, Ernest Mahler, of the Kimberly-Clark Company, H. P. Carruth, of the Mead Pulp and Paper Company, and with the assistance of sub-chairmen in various states, finally, in 1927, raised a fund of $10,000.

It was not an easy matter to find a man to carry this work on a satisfactory basis, but finally in the fall of 1927, Clarence M. Baker, State Sanitary Engineer of Wisconsin, was secured and he began his work November 1. Following Mr. Baker's appointment a second meeting of the general committee was held in Chicago in November, 1927, where plans for the first year's work were discussed and at this meeting it was felt desirable to change the name of the Committee to the National Waste Utilization and Stream Improvement Committee of the Paper and Pulp Industry. Mr. Baker went immediately into the field and by the time of the 51st Annual Meeting he will have visited practically all of the States east of Minnesota and north of Georgia in which the question of stream pollution is in any way an important one. Mr. Baker will make a brief report on his work to date at the annual meeting.

Woodlands Section

One of the first special activities developed within the association after March 1, 1920 was a Woodlands Section and when, three months later, O. M. Porter was brought into the association as assistant secretary, it was with the understanding that he would develop the Woodlands Section. He handled the section in a very effective way until the growing work of the association and the Woodlands Section made it necessary to employ a forester to give his full time to the work of the section.

So much interest was shown in the work of the Woodlands Section by the mills using pulpwood that special funds were then raised and on August 13, 1925, D. A. Crocker, formerly vice-president in charge of woodlands of the Eastern Manufacturing Company, was brought in as secretary of this Section. Almost immediately Mr. Crocker went into the Lake States, spending a number of weeks in a careful study of the pulpwood situation there. Upon this field study was based a report, which was printed and given wide distribution. The report met with fine response not only from the industry but from foresters outside, who are particularly interested in the pulpwood situation.

Following the completion of the report on the pulpwood situation in the Lake States, Mr. Crocker went into Virginia, West Virginia and North Carolina, to make a field study of the pulpwood situation there. Due to rather unusual conditions the report on the pulpwood situation in the Southern Atlantic States is not yet completed, but it is expected that it will be ready for publication early in the year.

The field studies both in the Lake States and in the Southern Atlantic States were made possible by special contributions from pulp and paper manufacturers in those sections to cover the traveling expenses of Mr. Crocker and publication of his report. Very helpful financial assistance was received for this work also from the American Pulp and Paper Mill Superintendents' Association and from the Supply and Equipment Association.

Owing to limited funds and the growing importance of the statistical service and other activities in the association it was felt wise to discontinue the services of a special secretary for the Woodlands Section and Mr. Crocker severed his connection with the Section on November 1, 1927. He continues as secretary of the Salesmen's Association of the Pulp and Paper Industry.

At the beginning of the work of the Woodlands Section in 1920, mills manufacturing higher grades of paper and many of the converting mills not directly interested in the production of pulp felt that the service of the Woodlands Section was of value to but a small part of the membership of the Association. Gradually, however, with the growing recognition of the importance of maintaining a permanent supply of pulpwood and pulp within the United States, the earlier feeling that the work of the Woodlands Section was of value to but a few of the mills changed until today most of the mills appreciate the very direct interest of the entire industry in forestry as an essential means of fortifying the industry with a permanent supply of wood. With but 4% of the primary raw materials of the industry represented by rags and the other 96% represented by woodpulp, paper stock and similar materials, there should be no question as to the advisability of the industry, through the association, carrying on the most aggressive work, that a pulp industry may be maintained in the United States. The effect of having pulpwood, pulp and newsprint paper on the free list on the continuation of the newsprint industry in the United States is all too evident. Perhaps it is too late to bring the newsprint industry of the United States back to the point of controlling a part at least of the newsprint market of this country. However, it is not too late, in light of the experience of the newsprint industry, to

Picture taken at the fifty-first annual banquet of the American Paper and Pulp Association, February 23, 1928, at the Waldorf-Astoria Hotel, New York City

develop means by which the pulp industry will be kept an active industry within our own borders.

Unless a pulp industry is maintained here there promise to be difficult times ahead of the paper industry. The converting mills and the fine paper manufacturers, though not as directly concerned with what forestry can do in maintaining a supply of pulpwood and pulp as are the self-contained mills and the individual pulp mills, nevertheless, must be deeply concerned for the future of the pulp industry in the United States.

Organizing Unorganized Groups

The articles of organization of the association indicate that one of the purposes of the association is to assist in organizing unorganized groups within the industry. The officers and the staff of the association during the past eight years have considered that they had a mandate from those who developed the articles of organization to do everything possible to organize unorganized groups and to assist in building up associations as they were formed. Outstanding service along these lines has been given by the association but as little has been said about it through the years the value of this service may not be generally appreciated. Several associations which went out of existence have been brought back into effective organization and new associations have been brought into being. The work which O. M. Porter, assistant secretary of the Association, has done as a part of the regular work of the American Paper and Pulp Association, in acting as secretary and building up several of the smaller associations, is outstanding.

Just as the efforts of any one of the associations toward legal stabilization of the business of the group which it serves may be upset by a mill manufacturing the same grade of paper but outside the organization, and that because that particular mill may have no understanding of its costs or of trends in the industry, so all of the associations in the industry will be limited some what in the effectiveness of their work until every group, which is justified in having an association, is fully organized. Therefore, not only because of the obligation laid upon it by its articles of organization, but because it appreciates the necessity for complete organization of the industry, the association should continue to function in the direction of organizing unorganized groups and of rendering every possible assistance to associations within the industry, either affiliated with it or not yet affiliated.

Development on the West Coast

The wide-spread interest evidenced today within the industry itself and by bankers and business men outside the industry in the further development of mills on the West Coast would appear to mean at least to the outsider that West Coast developments are entirely new and that it is a fertile field for a wide expansion of the industry. The industry knows well that there have been a number of fine, up-to-date mills operating on the West Coast for a number of years and has considered these western mills to be a very definite part of the industry of the country as a whole.

Several factors have influenced the development of a ferment of promotion on the West Coast which has already resulted in a number of new mills and will doubtless result in further building. Among these factors are: first, the condition of the lumber industry on the West Coast; second, the rapid development of the industry in the South; third, the pressure of accumulated funds in the banks of the country for investment; and finally, the turning of a number of the older eastern companies to the West as a source of supply for pulp. The ferment of promotion working on the West Coast has already resulted in more building in the industry out there during the past five years than anywhere else in this country in the same period. More building is ahead and it is apparent, because of the way in which development has taken place, that there will be considerable grief experienced before reasonable stability is reached.

Owing to the fact that no representative from the association had visited West Coast mills for several years and owing to widespread interest in western development, the secretary of the association spent seven weeks on the Pacific Coast during the past season. Practically every mill was visited, conferences were held with industrial committees of Chambers of Commerce and bankers and talks were given before Chambers of Commerce, lumbermen's clubs, etc. A report on the visit to the West Coast has been published with assistance from the western mills, and given wide circulation not only in the industry but among Chambers of Commerce, banks on the Pacific Coast, and others. An effort was made in this report to give a fair and reasonable picture of the situation and at the same time to indicate the necessity for the most thorough investigation of all of the factors entering into the building and operation of a mill before development was begun. There can be no question but that the visit of the secretary to the West Coast and the wide distribution of the report have been helpful in emphasizing to the business men of the Northwest the necessity for reasonable conservatism to the end that development as it comes shall be sound, permanent and profitable. At no time has the association or the industry opposed in any way the sound development of the industry in any section of the country. It feels, however, that so much is involved in the financing and building of a mill and a profitable marketing of the product that it is justified in emphasizing the necessity for thorough investigation and full knowledge of all of the factors involved.

With the large supplies of timber in the Northwest there is no question of gradual expansion of the industry in the north-western states. This development is bound to affect the industry in the East and South and it is, therefore, more apparent that the industry in the country as a whole should take ful cognizance of trends of development in every section and should work more closely together along legal lines, aways, of course, to see that progress in the industry is made on a sound, stable and reasonably profitable basis.

A Clearing House for Information

In any industry as diversified as the paper and pulp industry of the United States the trade association serving the industry must of necessity be a clearing house of information for facts of a technical, financial or general character. It has taken time for members of the association to appreciate its value as a clearing house of information but as the years have passed, since 1920, and as members have found that direct service can be given by the association in the way of information upon any phase of the industry, there has been increasing call for information from the member companies. Often the subordinates in a member company have come first to appreciate and use the reservoir of information inherent in the very character of the association. Often the chief executive of the company, who has the decision as to membership in the association, may have little cause to call upon the association for information, yet his technical men, his sales force, his cost men, or, as happens often, his attorneys or the merchants to whom he sells, come to the association for needed information. Several times within the past year or two in talking with company executives reference has been made to the direct service which the association is giving through the extensive files of information which it has developed for the use of its membership. These executives would indicate that they had not had reason to call upon the association for information but expressed surprise and gratification when informed that their subordinates had taken advantage of the association's information service.

In 1920, when the demand for information as to the industry began to develop, both from within the industry and at that time more largely from banks and other outside agencies, it was felt that this service could be made of much more direct value if it could be put into the hands of a man who could give full time to the service and to the development of the right kind of information for the trade and business press in particular. After several months of discussion of this particular service the secretary was authorized to employ a man of newspaper experience and Warren B. Bullock, who is now manager of the Import Committee of the American Paper Industry, was employed in December 1920 as director of the Information Service. Under Mr. Bullock the Service was extended along several different lines. A monthly printed bul-

letin was issued which was sent not only to the membership of the association but to some 200 banks in the different papermaking sections. The constant call for informative material as to the industry from other national industries, from organizations of business men, and from technical schools, resulted in the development of what was in fact a circulating library of available moving picture films as produced by a number of the mills and one or more sets of colored lantern slides were developed as a phase of the library. A surprising distribution of films and slides was given throughout the time that Mr. Bullock was in charge of the Information Service. This distribution has been continued somewhat since he left the association.

As a newspaper man of long experience, Mr. Bullock was able to put out a great deal of matter for the trade, business and public press, and was particularly helpful in connection with publicity for annual meetings, special conferences, etc.

Since Mr. Bullock left the association to manage the Import Committee it has been necessary to discontinue certain activities which he carried on as a newspaper man. The informational phase of the service, however, has been continued and as the demand for information has increased, it has been considered a function of the association to meet this demand.

The importance of a properly organized Information Service and of right contact with other industries and with the public generally is so great that as soon as funds are available it would seem as if the association should again have the service of an experienced newspaper man. Such a man would be invaluable not only in extending the service of the association as a clearing house for information but in taking the industry to the public and particularly the larger consumers of paper, in such a way as to make the public familiar with the intricate problems involved in the manufacture and marketing of pulp and paper. It is safe to say that if it had been possible to continue Mr. Bullock as director of the Information Service and if through him the story of the industry could have been told to the public of the West Coast states, the industry might have avoided the difficult competition which is promised from the overbuilding of the industry in the West Coast states.

Foreign Trade as an Outlet for American Pulp and Paper

Mass production in American industry is one of the marvels of the present industrial age. This development has been a perfectly normal result of increasingly keen competition, plus the application of the results of research and the introduction of technical control in the manufacturing plants of this country. It would seem as if mass production must result in the saturation of the domestic market and if a satisfactory outlet for product is to be maintained it would seem that the products of American industry must find their way into foreign markets. The successful efforts of the American manufacturers of automobiles in putting the American automobile in the foreign market seem to be very concrete evidence of this significant trend in American industry.

For years the American manufacturer of pulp and paper has found a fairly ready market for all of his products at home and, therefore, he has not been interested in any large way in the production of paper for the foreign market. Even though faced by the fact of over-capacity and over-production, the paper manufacturer has continued to insist that he is not interested in foreign trade. He has felt that by more efficient production and sometimes, unfortunately, by selling at little or no profit, he could find a market for all of his products at home. The multiplication of large and efficient mills in Canada and the development of the industry in the South and on the West Coast is creating a situation that would seem to indicate that the American paper manufacturer must do as the American manufacturer of automobiles has done and that is turn to the foreign market as a solution of the problem of more efficient methods of production and the rapid growth of the industry.

That there is a foreign market for American paper and paper goods is evidenced by the fact that the industry is quietly continuing to sell abroad from two to two and a half million dollars worth of goods monthly. A twenty-five or thirty million dollar market is worthy of consideration by the industry and no one who knows of the developing markets of Central and South America and of Asia and Africa is ready to admit that the limit for the sale of American paper and paper goods has even been approached.

Consistently during the past eight years the staff of the association has made every effort to secure facts as to foreign markets and foreign manufacturing conditions. So little accurate information as to the raw material situation and manufacturing conditions in Scandinavia was available to the secretary in the early years of his work that it seemed very desirable to secure first hand information; therefore in the summer of 1922 in company with Geo. W. Sisson, Jr., past president of the association, he spent nearly two months in Scandinavia and Germany. Because of the limited funds of the association he paid his own expenses. This trip of the secretary has proven invaluable to his work in the association since 1922. It should be of exceeding value to the association and the industry if a representative from the association could make annual trips to the pulp and paper producing countries of Europe.

The Scandinavian producer of pulp and paper, for obvious reasons, has always produced largely for the foreign market. The Scandinavian and other European manufacturers appreciate fully the great value of full knowledge of conditions in the countries to which they export pulp and paper. Therefore, for years the executives and the technical men of the pulp and paper mills of Scandinavia and other European countries have visited the United States not only to study markets but to visit the mills and to go into the whole question of raw materials, manufacturing possibilities of the American mills, etc. Fortunately, more and more of the executives from American mills have come to appreciate the value of foreign contact and from year to year more of them are visiting mills abroad. It would be mutually advantageous if there could be greater exchange of technical men between the pulp and paper industries of the United States, Canada and Europe. Such exchange is already beginning but more of the technical men from foreign countries are coming to visit American mills than we are sending to European mills.

Constantly while the association was publishing a monthly bulletin, information as to foreign conditions was given in the bulletin. Since the monthly bulletin has been discontinued, special bulletins as to foreign conditions have been sent out and there is opportunity for much greater service by the association along this line. In the program for the work of the association, accepted at the annual meeting a year ago, a Foreign Trade Service was authorized and the groundwork for an effective service has been laid, though relatively little has been done, partly because of lack of funds and partly because it has not seemed wise to duplicate in any way the activities of other agencies in the industry.

In this matter of foreign contact and information as to foreign conditions the association owes much to the Paper Division of the Bureau of Foreign and Domestic Commerce. This division was created upon the request of the industry through the association in 1922 and the first chief of the division was selected by the association. The work of this man, John Matthews, Jr., was soon recognized in the Bureau of Foreign and Domestic Commerce and he was advanced to the position of assistant director of the bureau. His duties as assistant director have prevented him from giving constant attention to the work of the Paper Division. His assistant in the division has been doing good work but the service rendered has not been all that it might have been, in large part because of an apparent lack of interest in the industry in foreign trade and therefore in the work of the division. In other words, the Department of Commerce was very ready to develop a special Paper Division in the Bureau of Foreign and Domestic Commerce but the division has not been able to function as effectively as divisions serving other industries because it has not been used as it might well be used by the paper industry.

Out of the contact of the association with the efficient work of the Bureau of Foreign and Domestic Commerce there came information as to the valuable service given certain of the other larger industries of the country by special trade commissioners who were provided by appropriations granted by

Congress to the Department of Commerce. These men were selected by the industries which they represented. Late in 1926 the association made formal request to the Bureau of Foreign and Domestic Commerce for inclusion in the appropriations to be asked for the year beginning July 1, 1928 of an item for a special pulp and paper trade commissioner for Europe. Even though the bureau felt that the industry had not made full use of the Paper Division of the bureau they acceded to our request and put into their askings for the department for the coming year an item of $15,000 for a pulp and paper commissioner. A special committee from the industry, headed by Norman W. Wilson of the Hammermill Paper Company, past president of the association, made a trip to Washington in October, 1927, and appeared before the Director of the Budget in support of the item for a special pulp and paper trade commissioner. So many requests from other American industries for special commissioners were received that the Director of the Budget did not include in the budget report to Congress the item for special commissioners. Therefore, the association went directly to the Congressional Committee having these appropriations in charge and we are much indebted to Congressman Milton W. Shreve, of Erie, Pa., chairman of the committee, for his interest and support of the askings for the industry. Through his support, and that of other members of Congress, appropriations were increased so that there is every evidence that a special pulp and paper trade commissioner for Europe will be made available for the year beginning July 1, 1928. Doubtless the association will be asked by the Bureau of Foreign and Domestic Commerce to recommend men qualified for the position and it is hoped that it will be possible to find a man or men who know pulp and paper thoroughly, who can be appointed to represent the industry in Northern Europe, in particular.

A special pulp and paper trade commissioner serving the great pulp and paper industry of the United States should be able to be exceedingly helpful in keeping the industry informed as to the pulp and paper industry of Europe, in all of its phases. Such a man should be exceedingly helpful to the association and to the entire industry in developing an effective foreign trade service in the association and a service which should make possible a considerable increase in the foreign business to be done by American pulp and paper mills.

Research and Technical Control

So much is being written today upon the value of research in industrial development that it would be almost trite to describe the place which research has had in the pulp and paper industry as it has been developed during the past thirty-five years. It may be said, however, that the outstanding position which the American paper and pulp industry occupies today is due in large part to the men who have carried on research in all of the various phases of the industry, from the forest, now the source of a large proportion of the primary raw materials of the industry, through the pulp and paper mill to the final consumer. There is always a certain urge toward research natural among men having to do with manufacturing processes of any kind. It is safe, therefore, to assume that improvements would have taken place in the manufacturing end of the industry, in particular, almost regardless of conditions which have affected either the raw material or the market. However, other influences which are affecting the industry to increase overproduction or competitive conditions are the influences which have furthered research in this industry and will continue to cause manufacturers to spend increasing sums for the purpose of improving technique in the mill, in the trying out of new machinery and methods, and in giving the product to the consumer in the most economical and satisfactory way.

There has been discussion at times of the possibility of pooling research among the mills to the extent of financing special forms of research in governmental or institutional laboratories or of developing a laboratory by the industry itself. An effort was made in Sweden to operate a common laboratory for the pulp and paper industry but because of factors which might apply more or less to the industry in this country the effort was not a successful one. Due to the fact that manufacturing methods are not standardized and may never become as fully standardized as in other industries producing a less complex commodity, it is probable that a general research laboratory, supported entirely by the industry, will never be developed. However, there are certain phases of research work which might be carried on co-operatively among non-competitive mills on a basis that should prove to be both economical and efficient.

It is probable that the part which the American Paper and Pulp Association can play most effectively in research and technical control in the industry is that of stimulating these activities through bringing to the industry information as to research and technical control in the industry in other countries and in other industries in this country. Much more can be done along these lines than it has been possible for the association to accomplish with its limited staff and limited funds.

The Technical Association of the Pulp and Paper Industry has gone much further and rightly so in emphasizing the value of research and technical control than has been possible for the American Paper and Pulp Association. Through the efforts of a secretary trained in the industry and through various committees to which have been assigned various technical problems of the industry, this association has accomplished a great deal for the industry, both in stimulating interest in research and in technical problems and in serving as a clearing house of information as to the most modern practice in various manufacturing operations and in mill research problems. Beyond a doubt the Technical Association can accomplish more and more for the industry as the years pass, particularly if the mills will give larger support to the association in the way of corporate memberships.

You will hear at this annual meeting of the association from an executive of one of the larger companies who is better qualified to speak upon the subject of technical control in the mills than any one connected with the association. Ernst Mahler, vice-president of Kimberly-Clark Company, has made a signal success of his work as a technical man in the industry and his paper on Technical Control, to be given at this meeting, should be given the most thorough consideration by the industry.

Because of his scientific training and long contact with educational work your secretary has been deeply interested in the technical phases of the industry and particularly in the furtherance of technical control in the pulp and paper mills of this country. Unfortunately, the pressure of other work and the fact that the Technical Association is particularly interested in this subject has made it impossible for him to carry on activities which the association could well undertake to further technical control in the mills. The problem of bringing about technical control in pulp and paper mills is not nearly as simple as it appears to be to the outside chemist and engineer not familiar with the paper industry. Regardless of the many improvements which have been made in the mills there is, after all, comparatively little standardization in manufacturing processes possible for the industry. Rule of thumb methods still continue and because of the elements of art in the manufacture of the higher grades of paper, in particular, it is probable that standardization will come slowly. Until standardization is achieved but limited progress can be made in the direction of complete technical control.

Cost and Financial Service

How often one hears today, when reference is made to what appear to be unpremeditated and unnecessary cuts in prices of paper, that the cut was made because the mill making it did not have a clear understanding of costs. The inference is that if the mill had had a good cost system and, therefore, had known exactly what it was costing to produce the paper being marketed, a cut in price, which might well mean selling below cost, would not have been made. Seldom do men argue against the recognized virtues of life though they may not live up to them. Like these virtues recognized as necessary in ordinary human life it appears to be very difficult to find among manufacturers any one ready to argue against proper understanding of costs of manufacture and the value of having uniform cost finding methods in an industry.

Even though it is difficult to find a paper manufacturer ready to argue against proper cost methods and a thorough knowl-

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edge of what it costs to produce paper, yet a rather thorough analysis of the cost situation in the paper industry makes it safe to say that there are a surprising number of mills which are attempting to operate at a profit without a satisfactory cost system and, therefore, without knowing their costs, all the way from raw materials through the mill, to the door of the merchant or consumer. Conditions of overproduction and competition, are such that no effort should be neglected, no stone unturned, that would create conditions making for stability in the industry and a reasonable profit for every paper manufacturer. It would seem to be high time for the industry as a whole to attack aggressively this vital question of uniform and practical cost accounting and cost knowledge to the end that no mill, large or small, shall continue without knowing its costs. It is clearly recognized that this effort could be carried out along perfectly legal lines.

In view of the recognized importance of proper cost knowledge in the industry and in view of the fact that it would not be difficult for the industry to determine the considerable number of mills which do not have satisfactory cost systems, it seems almost like a serious charge against the industry that more than ten years of activity on the part of the Cost Association of the Paper Industry has resulted in only partial success in bringing proper cost methods into all of the mills. In seeking support for the Cost Association, large mills which are doubtless more harmed by the price cutting methods of smaller mills than other mills of less consequence have indicated that they have their own cost systems and, therefore, are not interested in the Cost Association. Certain other mills indicate that they have gotten along fairly well without what they term an expensive cost system, and, therefore, they are not interested. Yet repeated unfortunate experience has proven that the mills, large or small, which do not have an adequate cost system and, therefore, do not know what it is costing to produce paper are the mills most like to upset the market by radical and unreasonable cuts in prices not justified by market conditions. It is indeed surprising that the mill having a good cost system and, therefore, appreciating its value should not be the first to demand that the Cost Association shall be so aggressive in its educational work that the industry shall not go through another five year period without every mill having an adequate cost system and knowing its costs thoroughly.

Linked up with the necessity for a proper knowledge of the cost of manufacturing and marketing pulp and paper is the desirability and further, what we believe will be come a necessity as the years pass, of a thorough knowledge of mill finance. We hear much today of the importance of railroad finance, agricultural finance, shipping finance, etc., and these are considered to be vital national problems. The problem of mill finance is equally important to the paper industry and the time must soon come when the industry, through such an agency as the Cost Association, or a Cost and Finance Bureau of the American Paper and Pulp Association, shall develop for the benefit of mill executives the same type of information as to mill finance as is now being so well developed by the association as to production, shipments, stocks, consumption, etc.

Committee Activities

As indicated previously in referring to the value in association work of standing versus special committees, the association has tried to bring committees into activity only as there was a definite need for them. All too commonly in organized effort today a discussion of any subject seems fairly well concluded if a committee is appointed to go into the matter, with the result that the appointment of a committee is often the end of the activity rather than the beginning.

It is a sound principle in trade association work to have as much of the work of the association done by the members as possible and commonly the best way in which to secure the help of the members is through service on a committee of real importance to the association and its work. With this end in view the association has had, during the past year, several committees at work upon necessary activities. These committees and their work will be described briefly.

Membership Committee

During 1925 and 1926 the Membership Committee of the association, under the chairmanship of Chas. A. Gordon, of Oxford Paper Company, was exceedingly active and did a splendid piece of work in adding largely to the membership of the association. As membership activities are continuously necessary in the association it seemed desirable to appoint a Membership Committee for the present year. However, after the appointment of the committee it was found that the proposed plan, which will be mentioned later, of changing the basis of membership dues, made it seem likely that the question of dues to be fixed for new mills as they come into the association would be somewhat difficult to answer and might prove an obstacle in the work of the committee. Therefore, the Membership Committee has not been active during the past year. However, the officers and the staff of the association have continued the usual membership activities and several new mills have been added to the association and two associations have been affiliated or have declared their intention to affiliate. These are the Bureau of Envelope Manufacturers of America, which came into the association during the past summer, and the Wall Paper Manufacturers Association of the United States, which has just declared its intention to affiliate.

In this connection, a new form of membership was decided upon during the past year by the Executive Committee of the association. This action resulted from the application for affiliation from the Supply and Equipment Association, Inc., of the American Paper and Pulp Industry. This association has been in existence for several years and has been very helpful to the American Paper and Pulp Association through lending its assistance in legislative matters and through direct financial assistance to such special activities as the Woodlands Section and the development of foreign trade. After the most careful consideration by the Executive Committee of the Association it was decided in the fall of 1927 to invite the affiliation of the Supply and Equipment Association as an allied organization, whose members should not have the right to vote or hold office in the American Paper and Pulp Association. It is expected that this affiliation will be completed before the termination of the present annual meeting.

Tariff Committee

As the question of proper tariff protection for the pulp and paper industry is of vital importance to the welfare of the industry and as the tariff question, unfortunately, is still a political question in this country, the Executive Committee deemed it a wise precaution to have a strong Tariff Committee in existence for the purpose of watching the tariff situation carefully, that it might be ready to function when the need comes. Therefore, a strong committee was organized early in the year, with Milton E. Marcuse of the Bedford Pulp and Paper Company, of Richmond, Va., as chairman.

Upon the suggestion of Mr. Marcuse a careful study of the history of the paper tariffs of the United States was made during the past season and published in pamphlet form. This pamphlet has received fine recognition not only in the industry but from other industries and from various governmental departments. The committee, through the association, is constantly gathering information which should be of assistance if and when the tariff question is again actively before Congress. A meeting of the Association's Tariff Committee will be held during Paper Week.

National Waste Utilization and Stream Improvement

As the work of this conmmittee was described at some length under previous reference to an engineer in the paper industry no further reference will be made to its activities. Clarence M. Baker, the association's engineer, who is secretary of the committee, will be at the association headquarters at the Waldorf-Astoria Hotel during Paper Week and it is expected that he wi'l make a brief report on his work at the annual meeting.

Classification of Paper

As clear and adequate definitions of various grades of paper

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and a satisfactory classification of paper are very important questions in the industry, a Committee of Classification and Definitions was appointed by the association some four years ago. This earlier committee with the able assistance of Dr. Clarence J. West of the National Research Council, developed what it had seemed impossible to get together up to that time and that is a series of paper definitions and a workable classification. Report of this committee was printed by the publishers of the Paper Trade Journal and given wide circulation in the industry. Though these definitions and the classifications were never accepted officially by the industry, yet they proved of inestimable value and the surprising thing is, in view of the recognized value of the report of this committee, that such a series of definitions and classifications were not gotten out by the industry years ago.

During the past four years, and particularly in view of the important work of the Import Committee of the American Paper Industry, and the necessity for better definitions and classification in connection with statistical activities, it was found that the definitions in particular needed revision. Therefore, early in 1927 a Committee on Classification of Paper was appointed with R. Frank McElwain of the Crocker-McElwain Company as chairman. This committee was made up largely of technical men, including Dr. Clarence J. West of the National Research Council, who had served so efficiently on the previous committee, and representatives of the Bureau of Standards and the Office of the Public Printer. Again Dr. West, who is vice-chairman of the committee, carried the burden of the work of revision. A meeting of the committee was held in Washington in December, 1927 to pass finally upon the revision of the previous report. This has now been issued in booklet form. Again it seems necessary to indicate that this series of definitions and classifications have not been officially accepted by the paper industry. As important as the matter is, it is probable that complete and official acceptance of the revised definitions and classifications by the industry will not take place for several years to come and in the meantime effort will be constantly made to correct, improve and complete these definitions.

General Committee on Carton Packaging.

As the result of an investigation of the use of fiber cartons for the shipment of sheet papers by Kimberly Stuart, of the Neenah Paper Company, and a report by Mr. Stuart on his work before the Writing Paper Manufacturers Association, request was made by that association to the American Paper and Pulp Association for the appointment of a general Carton Packaging Committee, to be made up of both manufacturers and merchants. Such a committee was appointed in 1926 and Kimberly Stuart was selected by the committee as its chairman. A third meeting of this committee was held early in 1927 in Chicago and full reports were made as to investigations of practicability of using cartons for the shipment of paper by both manufacturers and merchants, members of the committee, and by Albert W. Luhrs, of the Container Testing Laboratories, Rockaway, N. J. It was emphasized in all of the meetings of this committee that the purpose of the committee was to investigate only and not to carry promotion of use of the fibre container, particularly as there was not unanimity of feeling among manufacturers and merchants as to the value of the fibre container.

At the last meeting of the committee, held in Chicago in October, 1927, it was felt that the purpose for which the committee had been appointed was achieved and, therefore, the committee was disbanded with the appointment of a small special committee, with Mr. Stuart as chairman, to bring together the findings of the committee for publication in pamphlet form. As soon as the pamphlet is printed the committee will be disbanded and the work of the committee will be entirely completed.

Simplification and Standardization

A committee on Simplification and Standardization, with S. L. Willson of the American Writing Paper Company as chairman, was appointed at the opening of the present year. As this committee has felt that its work is largely the dissemination of information as to simplification and standardization it has seemed best that it should function through the staff of the association and, therefore, it has not been active during the year. The committee has held itself in readiness to come together whenever questions of simplification and standardization might come before the industry.

Committee on Statistical Procedure for the Paper Industry

As the work of this committee, under the chairmanship of C. B. Morgan of the S. D. Warren Company, was described at some length in the discussion of the statistical service of the association, no further reference will be made at this point to the work of the committee. As the committee in fact completed its activities with the acceptance by the Bureau of the Census of the revised pulp and paper schedules the committee has been disbanded.

New Uses of Paper

Appreciating the work that has been done in a number of other industries in the development of new uses for commodities and in trade extension it was felt that something of help to the industry might be accomplished by a small but representative committee which could investigate the question of new uses of paper. Therefore, a committee was appointed in 1926 with W. L. Carter of the Nashua Gummed and Coated Paper Company as chairman. Shortly after the formation of the committee it held a meeting during Paper Week of 1927 and plans were suggested for determining the kind and character of paper imported into the country from foreign countries and also for determining the kinds and quantity of papers consumed by other industries. As the carrying out of these plans involved the expenditure of money they were put up to the staff of the association.

Feeling that there was value in the plans suggested by the committee it was reappointed for the year 1927 but little has been done during the year even though the plans as suggested would doubtless bring helpful results to the industry.

This question of stimulating new uses of paper is of so much importance that it is hoped that the committee will be continued and financial means given the committee to carry out the work which it has proposed.

Other Committee Activities

Two committees, advisory in character, namely, Advisory Committee on Taxation and Advisory Committee on Transportation Legislation, appointed in 1926, were continued during 1927. The idea of these committees was to have groups of men especially interested in taxation and traffic available in case legislation or other matters came before the association. The Advisory Committee on Taxation, through its secretary, Thos. J. Burke, of the Cost Association of the Paper Industry, has taken up a number of tax matters during the past year and directly or through the American Paper and Pulp Association has put these matters before the members of the association.

Certain advisory committees for the U. S. Department of Commerce, the Bureau of Standards, the Department of Agriculture, and certain of the government Forest Experiment Stations, were continued from 1926 into the present year. These committees are in existence to serve as a liaison between the industry and the departments named.

Joint Committees With Outside Agencies.

Two joint committees to function with outside agencies have been very active during the year. One of these is the Joint Committee on Approved Pulp Testing Chemists, of which S. Goldman, English China Clays Sales Corporation, is chairman, and O. M. Porter of the American Paper and Pulp Association is secretary. The second joint committee is the Paper and Pulp Committee of the Atlantic States Shippers Advisory Board. Mr. Porter of the association is chairman of this committee and he has been able to make his committee a very active one during the past year.

Financing the Association

Adequate support for the work of the association has been a difficult problem not only during the past eight years but apparently from the very beginning of the association, particularly from the time it took on a paid secretary. This

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problem seems to have been met and apparently solved in one period and then, because the solution was not on a permanent basis, the association was again faced with the problem in a subsequent period.

When the present Secretary came into the association in 1920 he found it to be financed on the basis of what were in fact voluntary contributions from the affiliated associations. These voluntary contributions made up a large part of the income of the association. Outside of this support there was a very small income from membership dues from a number of mills which had direct membership in the association and which were grouped in what was then known as the Unclassified Division of the association.

As attempts were made to strengthen and increase the work of the association this irregular and uncertain method of financing was found to be both inadequate and unsatisfactory. While there was usually some agreement at the beginning of the year as to the amounts to be received from the affiliated associations there was never complete assurance that the amounts tentatively agreed upon would be received by the association before the expiration of the year. This resulted in an impossible situation, from a financial standpoint, as it was impossible to fix a budget and live within it. Therefore, deficits occurred and the recurrence of these deficits finally emphasized to the officers and the staff of the association that a change would have to be made if the association were to do business on a satisfactory basis.

Emphasizing the fact to the Executive Committee that no organization of business men could do business under the arrangements which were in force for the financing of the association, the president and secretary in 1923 secured authority from the Executive Committee to appoint a special Finance Committee to make a thorough study of the financing of the association to see if a sounder basis could not be arrived at. After a considerable amount of work the committee submitted a report at the annual meeting of 1924 which recommended a change from the existing plan to a method of individual mill membership and organization membership on the part of affiliated associations. This plan was accepted by the association and in the early spring of 1924 pledge cards were sent to members of the association which brought very satisfactory results and gave the governing board of the association definite figures as to income on the basis of which they were able to fix a budget. From the time of the acceptance of this plan until the present year, funds received from the membership have been sufficient to meet the expenses of the association and a small reserve has been set up.

However, the new plan accepted in 1924 continued the arbitrary fixing of membership dues for individual mills. The unsatisfactory character of this arbitrary method of fixing dues for individual mills was emphasied, particularly during the aggressive membership campaign of 1925 and '26, and it was increasingly evident to the Executive Committee and the staff that a method of fixing dues must be developed which would be recognized as fair and equitable for all types of mills. Therefore, after investigation, Norman W. Wilson, then president of the association, recommended to the Executive Committee, at its meeting in February, 1927, that the association should consider the adoption of a plan for the fixing of dues on a gross sales basis. The Executive Committee passed favorably upon these recommendations and they were put before the association at its fiftieth annual meeting, where a resolution was adopted authorizing the president and secretary to make further study of the fixing of dues on a gross sales basis and be ready to recommend a definite plan at the fifty-first annual meeting.

A most thorough study of this whole situation has been made during the past year and a plan for the fixing of dues on a gross sales basis was submitted to the Executive Committee at a meeting in November, 1927. The plan seems to be a sound one and doubtless could be worked out on a basis that would be satisfactory to the entire membership. In fact, upon request from the officers of the association more than 150 mills submitted their gross sales figures for 1926 on a confidential basis. These formed the basis for the development of the plan referred to above.

This return indicates the interest of the member mills in a sounder plan of financing.

For a number of reasons, however, it has seemed wise to the Executive Committee to delay action on the proposed plan of the fixing of dues on a gross sales basis and to continue the financing of the association for the coming year on the same basis as that in existence during the past three years.

Whatever the further development of the association may be, the important problem before it will be the adoption of a plan of financing which will be considered fair and equitable by individual mills of all classes and which will produce funds adequate for the proper carrying on of the activities of the association.

Raw Materials for the Industry

An adequate and a permanent supply of raw materials of both primary and secondary character are fundamental to the future profitable operation of the pulp and paper industry. This is a truism which might well be applied to any American industry. However, the raw material problem is of unusual significance to the pulp and paper industry because its supply comes from what is today considered to be a slowly disappearing natural resource.

The operations of the paper mill are a part of a circle, one segment of which is the forest and another the pulp mill. No segment of the circle, as result of a feeling of self-sufficiency or isolation, can with safety quarrel with any other segment, or get along without any other segment, if the circle is to be sound throughout all of its parts.

The paper converter may assume to be quite independent of the forest and of the pulp manufacturer but let either of these factors or segments of the circle disappear from the country and the profitable operation of the converting plant will be a short-lived affair. But why discuss a self-evident truth? Rather than discussion there should be full understanding of the place of each of the factors in the welfare of the industry and full support of the activities of each of the operations from the growing and harvesting of the forest to the final conversion of the ultimate product.

The American Paper and Pulp Association is the one agency that is putting the power and the force of the entire industry back of the protection and perpetuation of the fundamental raw material supply for the industry. This matter has been discussed in part under the general discussion of the Woodlands Section activities and further mention is made here only that the question of raw materials for the industry may be emphasized as a vital factor in the success of every phase of the industry.

While the primary raw materials, that is, wood and cotton fibres, are presumably more fundamental than other raw materials, yet the so-called secondary raw materials such as sulphur, rosin, china clay, glue, coloring matters, etc., are in a sense equally fundamental as a finished sheet of paper cannot be produced without adequate supplies of these secondary materials. So far the industry as a whole has paid surprisingly little attention to this question of raw materials as a whole and in all of its ramifications. Some attempt has been made during the past year, through the statistical service of the association, to analyze conditions in the secondary raw material markets. From what has already been done it is more than apparent that a further study of these raw materials, in fact continuous study of them, could be made a profitable investment for the industry.

It would seem as if the chief attention of the paper manufacturer is all too often focused upon the production of pulp or paper in the mill. While, of course, this is one of the most important phases of the industry, yet all of the economies effected in production in the mill may easily be offset by lack of attention to supplies of raw material or to economical distribution and marketing. Perhaps the industry, through organized effort, may be able to accomplish outside of the mill what has been so well accomplished by concentration upon activities within the mill.

The Secretary and the Association

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American Paper and Pulp Association, with its many varied and important activities, must be more than a secretary if he is to serve the association effectively and the industry which it represents. The secretary of the American Paper and Pulp Association must be in fact the general manager of a business organization made up of a great many individual business units. Industry is demanding much more from the secretary or the general manager of a trade association than these names indicate, when applied in the ordinary business corporation. The secretary must in fact be a leader in all of the organized activities which make for mutually beneficial service and for better business.

Should a larger and more comprehensive organization be developed for the paper industry in the years just ahead built up as a superstructure upon the foundation which has been laid during the past eight years, the governing board of the organization must expect to place a man in charge of the organization who can not only function as a secretary and a general manager but who shall also be a leader for the various elements involved and who can unify the industry in its efforts to solve common problems and strengthen its contacts with other industries, with governmental agencies and the public.

The trend toward mergers in business has apparently influenced a number of industries in the direction of similar trends towards the merging of organizations serving those industries. Several industries have already merged their various associations into superorganizations known as institutes and other industries are now considering such mergers of trade organizations.

As already emphasized, acquaintanceship and friendly contact, plus the confidence which results from such acquaintanceship and contact, are very fundamental to the success of a trade association. It may be that this trend toward the merging of associations serving an industry has some danger in it. It seems more that probable that in certain of the industries where centralization of association effort has been carried through by dominant groups a reverse trend will appear leading back towards decentralization and the strengthening of the smaller groups where manufacturers producing a similar commodity can be more closely associated in meeting the problems inherent in the work of the smaller group.

As men, in their development as human beings, apparently have to go through certain periods of growth, so organizations of men seemingly must proceed normally in their evolution from one period of development to another. As the paper and pulp industry is now organized and as the associations serving it have been gradually developing from one period or stage of growth to another, it is quite possible that the most satisfactory future development of the association will be the steady advancement of the present organization by gradually increasing funds for its work and strengthening of personnel of its staff.

What's Ahead in Business

In this report of the Executive Secretary, which is much longer than previous annual reports, because it is more or less a summing up of his work for the association since 1920, it would hardly be in place to comment upon what are ordinarily known as current business conditions. Such comments are less necessary at this time than in previous years because of the association's Weekly Business Review. Furthermore, the trade and daily press during the first weeks of the year have been full of comments on business conditions by leading bankers and business executives. Generally speaking, however, business in the pulp and paper industry during 1927 was not as satisfactory, either from the standpoint of production or profits, as in 1926. Production, though slightly less than in 1926, was maintained on a surprising scale and yet business was not satisfactory considering the industry as a whole, because profits were not what they should have been.

Hope springs eternal in the human breast and so the universal hope among business leaders is now for better business in 1928. There will be better business in the pulp and paper industry as each individual manufacturer keeps himself thoroughly well informed of all the factors entering into the business and then seeks business that will bring him profit. Business may well continue bad where pulp and paper is sold below cost and where relatively too much importance is given to production as compared with profitable merchandising.

Constant changes are taking place in industry in the United States. Vision and foresight will not only indicate these changes but will prepare business for the future. Too often and particularly where a manufacturer prefers following the "go-it-alone" policy rather than profiting by co-operation and co-ordination in association with other manufacturers in the same line, business seems to be static and in a more or less fixed condition. It is not enough to produce as much paper as possible from day to day and to crowd onto the market all of the product that it can possibly absorb. It is fundamental and necessary that the idea of business as a fixed condition shall be replaced by the idea that business is dynamic and ever on the change. Constant change is taking place and at times it is difficult to appreciate these changes unless reasons for the changes are known and these reasons are under constant observation.

It would be a splendid thing for the industry if equilibrium as between the various groups of pulp and paper could be maintained. At all times the secretary and those associated with him have worked for the maintenance of reasonable equilibrium. Geographical changes in the production of newsprint paper, evidenced by the building of the great newsprint mills in Canada and the Northwest, have caused many of the manufacturers of newsprint paper in the United States to consider and indeed to put into effect changes to other grades of paper. Northern mills manufacturing wrapping paper in part because of the development of the kraft paper industry in the South, have felt that salvation lay in the direction of producing other grades. Unfortunately in all of this the simplest and easiest phase in the change from grade to grade is that of production. The most difficult and the most disturbing situation is the fact that a wrapping paper mill, for instance, after years of production and with full knowledge of the wrapping paper market, by changing to some other grade, goes into a market with which it is not at all familiar. The tendency is apparently from the lower grades to the higher and to specialties. While these changes in the mills may be disturbing to the industry as a whole, doubtless they are a perfectly normal development and to be expected, yet it would appear that changes from grade to grade are sometimes made before the possibilities of development in the original grade have been exhausted, and it has been in this direction of stimulating the most complete development of grades already in production that the association has striven to be of assistance.

The vision and far-sightedness which has been suggested as fundamental to keeping abreast with modern developments and which, as applied by various mills, has meant the salvation of these mills, has doubtless been the cause of many of these grade changes. There is every reason to believe that changes in grades made upon the basis of the exercise of vision and far-sightedness are desirable and to be welcomed by the industry. Naturally, the manufacturer whose field is entered by the mill which is stepping its grade upward as a necessity of existence, dislikes the condition of disturbing equilibrium. Yet as an economic necessity it must face the increased competition and eventually, if it is to continue its business on a profitable basis, must meet the situation by reduced costs, increased manufacturing efficiency, closer study of markets, etc., with change in its grades only as a last resort.

Human Contacts in the Industry

Because of the way in which the paper industry has developed, often as isolated plants in separate communities, and because of the development of the personnel of the executive force of the mills, the industry as a whole has had fewer problems in industrial relationships than many of the other larger and younger industries. It is greatly to the credit of the industry that many of the leading executives of today have come up through the mills and through the years have known the men working in the mills intimately and have been able to maintain the finest of human relationships. In fact it would appear that there are very few other industries of the country where there are more outstanding self-made men than in

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the paper industry. With greater corporate control of the companies this condition is bound to change and with the change there may come increasingly difficult industrial problems.

So far the association has paid little or no attention to the very important question of industrial relationships and problems. It would seem as if the time had come for the association to have an industrial bureau, serving at the beginning largely as a clearing house of information as to the way in which industrial questions are being met in the mills throughout the country. It is not a question of open shop or welfare work or of some of the other problems that have been difficult to meet in other industries, because in a way, the paper and pulp industry has been faced with all of the problems inherent in the question of industrial relationships. It is, rather, a question of securing the best in industrial relationships for all of the mills, and this best cannot be secured except through organized effort, as represented by the association.

Distribution and Marketing Research

A number of years ago the father of the author of this report was a lumberman in Northern Wisconsin. At that time the lumber industry in the Lake States was in the zenith of its development and was the great industry of the region. This man made a comment as to the activities of the lumbermen of that time which has remained with the secretary through the years. This comment, made in reference to the business of the average lumberman, was that he was sweating blood to produce lumber and was then turning around and giving it away. Sometimes this comment seems to apply to the paper industry to day. It would seem as if too much attention were being paid to production; that the maximum effort is being put upon the turning out of paper, and then the paper is almost given away. The time appears to have come in the industry where it would be an exceedingly profitable thing for the manufacturer to apply the same energy and business acumen to distribution and marketing that has been applied with such successful results to production. There can be little question but that the biggest piece of work before the association is distribution and marketing research—research that will result in the continued production of paper, of course in the most effective and economical way, but which will further the sale of paper at a reasonable profit. This research will probably have to be carried on in the closest cooperation with the merchant and with the assistance of every possible outside agency, governmental or private.

Such financial figures as have been developed for the paper industry by the Robert Morris Associates, the national organization of bank credit men, the Cost Association of the Paper Industry, and by certain individual bankers—and most of these figures have been available to the association—indicate that too many pulp and paper mills are making three or four or five per cent gross when they should be making sixteen to twenty per cent gross if they are to continue as profitable industrial institutions. The problem of putting the pulp and paper mills of this country on a profitable basis is an exceedingly difficult one and yet it is so vital that it should have the best brains and energy of the industry focused upon it. It is not a problem that can be solved by the individual mill and must be solved by organized effort.

The association should not be left in a condition where it can but point out this problem from year to year, but it should be given the support of the leaders of the industry and the means to employ men who, under the direction of these leaders and the manager of the association, could carry on research which would come as near the solution of the problem of distribution and marketing as is possible in industry today.

The Secretary Leaves the Association

After eight strenuous and yet very worthwhile years it was difficult for the secretary of the association to come to a decision to leave the association and the industry for work with the Chamber of Commerce of the United States at Washington. Decision to take the new work at Washington was arrived at finally only because of what appear to be the larger opportunities and wider contacts, which promise to result from the development of an entirely new department in the Chamber; namely the Trade Association Department.

While the experience of your secretary in the work of the association, since 1920, has often seemed to him to have been made up of more than the average number of difficulties in such work, yet it has been an experience of exceeding value and one which will be remembered always with appreciation and gratitude. Coming into the association in 1920 with certain preconceived ideas as to the business of the industry and as to the activities of a business man's organization, the process of adjustment to the new work with resultant necessity for changing preconceived ideas, was not an easy one. Hard work was put into getting acquainted with the details of the industry and with the work of the association. Out of this hard work came a belief in the industry and the men back of it, and an enthusiasm for the work of the association serving them, that made every experience seem worth while and every effort to improve the association as a service organization seem more than justified. After eight years the secretary is confident beyond a doubt that in no other industry in this country is there any finer group of business men than in the paper industry and the most inspiring idea to him in all of the work has been the opportunity of serving these men and the industry in a way that should make for more satisfactory business for the industry and that from every angle.

It woud be impossible to enumerate the men who have been of help to the secretary in his work with the association. With deep appreciation he takes this occasion to express his heartfelt thanks for the friendly counsel and help which these leaders of the industry have given so generously through the years.

The secretary has been fortunate in having as his immediate assistant the man who has been appointed to succeed him as acting secretary, and the other men and women who have worked with him in the association through the trying years of reorganization and development. As with the executive in any organization, the secretary has often been given credit for work that has been done by his subordinates. There has been team work and it has been this harmonious working together of the men and women in the offices of the association which has made the years particularly attractive and worth while. Few of the members of the association appreciate the hard work that has been put in by the staff in trying to bring about results and results that often seem to be of so little importance to the industry. It isn't necessary that the members should appreciate the hard work of the staff. That is to be expected but it is fitting that the secretary should give public recognition to the fine service which the association and the industry has received from the men and women who have worked with him since 1920.

In his new work as manager of the Trade Association Department of the Chamber of Commerce of the United States at Washington it may be that the secretary will be in a position to assist the association serving the paper industry and perhaps at times the industry itself. The opportunity for such assistance will be welcome indeed and it is hoped that these opportunities will come often enough so that the friendly contact of the years with pulp and paper manufacturers and the men and women in the association may not be broken. May it not be that the friendly helpful contacts which we have been able to maintain with other men and women through the years will count more, when the time comes for summing up of life's activities, than what we have been able to lay up in monies and goods or even in the way of reputation, much as these may mean at times.

Budget Approved

After he had responded to a suggestion by President Everest concerning further comment on his report, which brought a renewed expression of regret from Doctor Baker at leaving the association, the treasurer's report was called for. This was read by Secretary Porter and stated that based on ten months' expenditure the income of the association would be sufficient for the budget year now closing. For the budget as of April 1, 1929 an appropriation of $65,900 would be sufficient, based on the same dues as last year, though the

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total was $4,000 less than last year's budget. On motion the budget was approved.

Before proceeding to the reading of his annual address President Everest appointed a nominating committee of five members, headed by W. J. Reybold, with instructions to report a full ticket at the afternoon sitting.

President's Address

President Everest began by reminding those present that at the last annual meeting it was decided to hold the meeting of the American Paper and Pulp Association on an earlier day of the week and make it a full day's session. This was why they were meeting on Tuesday instead of Thursday, and the new custom would be continued if it was found to be a successful innovation. He then reviewed the work of the past year, mentioning that President Norman W. Wilson had made several recommendations for the good of the association and as a member of the executive committee would know that the present administration had not been negligible in carrying them out. He referred to the resignation of Dr. Hugh P. Baker as secretary to accept the management of the Trade Association Department of the Chamber of Commerce of the United States and the appointment of Oliver M. Porter as acting secretary, and continued as follows:

Features of Association Service—"Three outstanding features of the association service have been developed and are now contributing to the welfare of the industry. First, The Statistical service as developed by Paul S. Hanway and which is constantly proving of increased benefit to those who use this service.

"Second, the work of the National Stream Purification Committee of the Pulp and Paper Industry which resulted in the engaging of Clarence M. Baker, formerly State Sanitary Engineer of Wisconsin as engineer for the committee and who has already rendered valuable service in connection with this work.

"Third, the excellent work of Dr. Baker in his survey of the pulp and paper industry in the West Coast States. There had been so much talk of development along the West Coast that the Executive Committee decided that we should have some definite information as to the extent of this development and accordingly Dr. Baker was sent to the Coast to make a survey, the result of which has been published, through the courtesy of some of our members, and circulated among the membership. There was also prepared by the Tariff Committee the complete tariff history of duties on pulp and paper from the beginning of this government down to date. This is the most comprehensible and understandable statement of tariff history applying to this industry which has been published.

"I wish to thank the officers and members of the Executive Committee and others who have met and counseled with us during the past year, for their loyal support and helpfulness in carrying on our work and also to acknowledge, with deep appreciation, the excellent work of the secretaries and the staff of the association who have conducted the affairs of the organization so efficiently. I also desire to express my appreciation of the hearty co-operation and support of the trade press during the past year. It has been extremely helpful in getting before the members and non-members, full publicity relative to our work.

Developments for the Future—"During the past year several gentlemen of high standing and importance in the industry have suggested to the Executive Committee the necessity for a change in the form of organization in this association. As it developed, this seemed to be the most important suggestion which has come to the attention of the Executive Committee. The arguments in favor of some changes were so strong and seemed to have so much merit that it was decided to submit this subject to this meeting and ask the approval of the membership of the appointment of a committee which would, during the year of 1928, investigate the subject and submit a plan of organization to the membership either at a special meeting to be called in the fall or at our next annual meeting. It is contemplated that ample time shall be taken for the investigation so that every branch of the industry is given an opportunity to submit their suggestions and to avoid rushing into some new plan of organization which will not prove workable or an improvement on the present form. There has been some criticism advanced that we have changed our form of organization too frequently in the past and that we should have adopted some plan and stuck to it, but with the changes in the industrial situation in this country in the last fourteen years and the constantly changing conditions with which we are now confronted, it seems only reasonable that forms of trade associations and their activities might well change with the changing industrial situation. We are today in the throes of what has been termed the New Competition, about which, we learn more from one of our distinguished speakers. If we have new competition, and there seems to be no doubt that we have had, since the war, a new something, which is rather disturbing to the industry, then we ought to meet it with a plan of organization suited to present day needs.

Present Form of Organization—"As we are organized today we have the central organization known as the American Paper and Pulp Association with affiliated organization of three kinds, as follows:

1—Affiliated association of manufacturers of different kinds of paper, such as writing, wrapping, waxing, etc.

2—Affiliated associations of groups of specialist employees, such as technical men, superintendents, salesmen, and cost accountants.

3—Operating committees, which in turn are subdivided into two groups:

a—Self sustaining groups, operating outside the American Paper and Pulp Association, but in harmony with it, such as the Import Committee and the Committee for the Perpetuation of the American Paper Industry.

b—More or less self supporting groups such as the National Waste Utilization and Stream Improvement Committee, operating out of the Association office.

Objections to Present System—"The present situation undoubtedly, as operated, results in some duplication of work, as for instance the collection of statistics by the central organization and also for groups by the group associations. This results in internal questions, involving the line of demarkation between the group and the general organizations.

"Also, there is a possibility of similar difficulty as between other groups; for instance the Import Committee's work involves a study of foreign conditions, while the association has a Tariff Committee to direct legislation, and also needs the same information for export trade developments as that required by the Import Committee as a basis of effort to enforce the law.

"The present situation is the result of a long development of the various groups along their own particular lines, which at times seem to involve intrusion of one group's activities into the field of other groups. New activities have developed and it has been necessary to finance them separately.

"The result is that while highly organized, there is undoubtedly an overlapping of various groups, and that the organization has become so detailed as to fail of its purpose at times, that is, the alignment of the entire industry for the achievement of generally desired results.

Proposed Solutions and Their Analysis—"Three solutions are open:

(1.) Continuance of the present situation. (2.) Amalgamation of operating committees in the organization. (3.) Formation of a new super-organization, to combine all existing activities in such a manner as to eliminate overlapping and still to allow different groups to maintain their present independence in group problems.

"The first solution is most simple, but the organization is anoamalous and will always have the elements of unnecessarily duplicated overhead. In theory it is not correct even though it has been possible for all groups under the existing arrangements to accomplish some excellent results. I believe, however, that with adequate financial support and with more definite allocation of work and co-operation effort between this and the affiliated organizations in the elimination of duplication of activities the situation can be materially improved and strengthened.

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"The second solution has its chief difficulty in the unwillingness of well organized groups to be placed on an equal basis with other groups perhaps not so well organized. Also we have the difficulty of taking over the operating committees which are financed by members and non-members.

"The third solution seems to offer opportunity for avoiding group jealousies and rivalries, and at the some time to offer the centralized supervision by the entire industry of the whole fabric of association activities which would seem to be theoretically advisable. Perhaps the thing we need is a dictator to direct all the activities of manufacture, conversion and distribution but up to date no one has been able to suggest a man who possessed the necessary God-like intelligence to carry on successfully such an ideal work.

"The idea suggested is that of an American Paper Institute fashioned along the lines of several other organizations now in use by prominent industries in the United States, as the steel, copper and iron institutions. Whether this shall be an organization which deals with only the general problems of the industry and shall seek to extend the work through organization of unorganized groups, thus bringing together a stronger organization or whether it shall become a unified organization with a general manager and with the several associations and committees as departments of the parent association depends of course on the members and their expression to the proposed committee and the final approval of the association as a whole.

"We have today a gigantic industry, ranking seventh in the United States in value of product. We have annual sales of paper and paper products slightly in excess of one billion dollars. We have an estimated productive capacity of twelve and one half million tons annually. In 1927 we produced slightly under ten million tons or 80 percent of the possible production. During the year we consumed something over eleven and three quarter million tons, indicating an importation of approximately two million tons, most of which was newsprint originating in Canada.

The Question of Overproduction—"With this situation, in as high a consumptive year as we have ever had, it is not difficult to figure that we have a large potential productive capacity at home and in Canada, which cannot be utilized to advantage. If we had manufactured the entire amount used in this country last year, we should have still had seven to eight per cent of capacity available and not operating. The major portion of newsprint paper consumed in this country comes from Canada and this is a situation which will constantly continue. Canada has installed capacity beyond its domestic and foreign demand and undoubtedly will have for several years to come. With this potential productive capacity both at home and in Canada hanging over us, it should be evident to all that we have a condition to face which calls for the most intelligent handling of the business of the industry. We are overproduced by at least twenty-five per cent in totals, with varying percentages between the several groups or grades. The pulp and paper industry is in no different situation than probably 90 percent of the industries in the United States. Does not such a situation demand that we have an organization embracing every branch of the industry, organized in such a way as to be able to give promptly, accurate information as to production, importations, consumption, and all of the other vital statistics which are so necessary to the proper handling of our business?

Need of a Strong Organization—"There is a wide variation of product in the paper industry but nearly all of these are, in a way, interrelated. We have need for a strong organization to handle the general problems of the industry. We need the co-operation and support of every pulp and paper manufacturer in the United States. There has been altogether too much of the idea that 40 percent of the concerns engaged in this business should carry the load for the balance, and while the 40 percent of concerns affiliated with the association probably represent 75 percent of the tonnage produced, yet the time is not far distant when all manufacturers must realize that, in this highly competitive over-produced industry, if things continue on an unrestrained and unintelligent productive basis, it will result in such an undesirable condition as is usually expressed by the sinister phrase 'a survival of the fittest.'

"We have built up through the co-operation of superintendents, engineers, technical staffs and machinery builders a highly efficient manufacturing department, capable of producing more products than ever before at lower costs. The machinery to accomplish such results is constantly in motion. In a business dependent on chemical and mechanical processes, we are apt to have new discoveries brought about through research, which will upset our whole present day system and add to the difficulties of an already complex situation. Are we to build up a gigantic machine, which, through our failure to regulate properly its production or to develop uses and markets for its products, will destroy our business rather than make it more profitable?

"Would it not be better to lend support to an organized effort which will give the facts and enable those who produce to do so with the information as to the possible absorption of their products and not overload the market with goods which creates a condition which in the long run is not of benefit to the public, nor to the concern which produced them?

"I appeal to the thinking men in this industry to help us to work out a plan which will tend to prevent the destructive factors of present day business from destroying this industry.

"As the changing conditions due to the great war have forced our country into more consideration of internationally political and economic problems, so the changing conditions in productive capacities, the developments of new materials and consequent new locations, the constantly new competitive situations which have arisen have forced this industry into the consideration of its problems on a national and even an international basis.

No Need for Sectional Groups—"There is no longer any need for sectional groups or associations except for purely local problems. The South in its production of Wrapping and Bag papers and the West Coast in its diversified development is as important a factor in competition with a New York manufacturer today as are the mills located in Maine or Wisconsin and the competitive action of central States mills or eastern mills is equally as important to the South or West Coast. None is exempt. The action of the one affects the other. Some may think they occupy a peculiar position, safe and secure from the inroads to be made by others, but such is not the case. The trend in the industry has been toward further expansion which only tends to make the situation more acute. What we need is a breathing spell in building and expansion programs. Concerns in which I am interested as well as those in which you are interested have been carried away in the mad scramble to produce more and reduce overhead. We need an agency which can collect and disseminate information relative to every branch of the industry and which can have the co-operation of every manufacturer in these various branches. It seems to me that it is high time we were in position to give investors and bankers who make further developments in this industry possible, accurate information as to the possibilities within the industry. Too many persons promoting new projects make accurate surveys of the source of raw materials, water supply, power, labor, location, and all the other factors of manufacturing and leave out of the picture the one important factor of whether or not the market will absorb the production.

Ill-Advised Expansion—"We have affiliated with this association several well organized groups and the better the organization, the better the condition existing in their business. It may be that the suggested super-organization may be of more benefit to the poorly organized or at present under organized groups than to those which are well organized and which have borne the burden of work and expense over the many years of association work, but, with the present tendency to shift grades within mills and to put old mills onto other grades, the availability of accurate information through a comprehensive association becomes equally important to the well organized groups as to the concerns which contemplate such changes. We need a unified association with closer contact between the several groups. There was used in this country last year approximately only forty thousand tons of

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bleached sulphite for the manufacture of Rayon and yet we hear of at least two projects for the manufacture of cellulose for this purpose, one from an annual plant growth and one from spruce wood, each with an estimated capacity of 100 tons a day or a total of 60,000 tons annually or 150 per cent of the total consumption of this product for that purpose last year. Where do these people expect to find their market? Do they expect those now engaged in that business to sit idly by and see their tonnage taken away? Here is a comparatively new development in the use of cellulose and one which, if properly developed, might mean a profit for some one in the industry, and yet if these proposed projects are carried through to a successful conclusion the competition is bound to eliminate the profit which should follow the development of a new use of this sort. We have had and will have many instances of this kind. It may affect your business today or it may affect my business tomorrow. Is there not some way by which some of this can be eliminated?

May Force Government Regulation—"Free and unrestricted competition may have been the life of trade under certain conditions, if such conditions ever did exist, but today it is ruining more than one industry. Practically every industry is faced with the same condition. Are we, who make the carrying on of business possible, the one essential industry which furnishes the material on which all business transactions are recorded; on which the products are advertised; in which they are wrapped, protected and delivered and without which products of our present day business could not exist, are we to be dragged into the same unrestricted and ruinous competitive situation as the other essential and non-essential industries? Something must be done to stabilize conditions, either through intelligent action on the part of those engaged in the industry, or through governmental regulation or supervision, or a combination of the two. I am not an advocate of government in business but unless industry finds a way to correct the abuses within itself, legally and intelligently, I see no other way out. Conditions could become so extreme as to force governmental regulation through public demand.

Asks for a Committee—"What I would like to see done is to have this suggestion of the appointment of a committee approved at this meeting and to have the help and hearty support of every member during the coming year in assisting the committee in the preparation of a plan for the future operation of the association. Whether this should involve an enlargement or extension of the present federated plan to include all general service activities or should involve the adoption of the so-called institute plan, is a matter for the membership and the committee to decide, but I do feel that something should be done to put us in stronger position against the time when industrial problems become even more trying and more complex than they are today.

Co-ordination Needed—"We have much of the fundamental work begun, but we need co-ordination. I do not believe there is an industry which has so unique an organization as our Import Committee and but comparatively few realize the wonderful work they have done. No industry with which I am familiar has such an excellent organization as the Technical Association for the discussion of its technical problems. Their present effort to excite interest in students in the various colleges and universities to train for the pulp and paper industry, will I believe, prove of great benefit and will help to improve the personnel of our organizations. This afternoon we will hear from one of the most prominent technical men in the industry on the subject of "Technical Control."

"Probably no other industry has an organization comparable with our Superintendents' Association, wherein such benefits for the men and for the companies which they represent, have been derived. We will hear from the president of this association today relative to their program. The Salesmen's Association stands alone in its field and has, through its promotion of friendship and good will and its many other services to the industry, made itself an indispensable part of our association work. The Cost Association has contributed greatly to the success of our business, and I hope the time may come when every concern may, through the operation of a uniform cost accounting system, have accurate information as to grade costs and so far as practicable can compare their relative profits on a machine-hour basis. Twenty-four hours of machine operation per day is all that we have to sell and such a basis of determining profits is well worth investigation.

"The Woodlands Section is doing and will continue to do an increasingly important line of work. The future of a large part of the raw materials for this industry depends on the forestry policy of this country. Research in forest practice and management and in wood utilization is the salvation of this industry and will insure its perpetuation in this country. The recent employment of an engineer in the matter of stream purification and the work being done by private and governmental agencies in the utilization of sulphite waste liquors bids fair to turn what first looked like an item of expense in its disposition, into one of profit to the industry.

"These and many other activities are being carried on, all of which promise beneficial results to those who participate in the work.

Problems of Finance—"You will recall that last year President Wilson called attention to the financing of this organization and it was proposed to use the gross sales as the basis of contribution. Several letters were sent out and about 160 of the members reported their gross sales for 1926. There were but few objections on the part of members to giving sales information. The plan was commended by many as being the only fair and equitable basis of assessment. With the data obtained, Secretaries Baker and Porter worked out a suggested plan which the Executive Committee discussed at several meetings and it was decided to present this plan to this meeting, but shortly after, the matter of change of form of the association was brought up and it was decided that the change in plan of financing should be included with the plan for the new association rather than to change the scheme of financing now, and then be compelled to set up on some other basis later. Accordingly it is the plan to go through this year on the same basis as heretofore and I sincerely hope that you will all extend the same financial support as in the past. While the investigation of some new plan of association is going on there will be no let up in the work as presently organized, in fact, we believe the association is in better position to render service than ever before and that the value of your connection with the association will constantly increase. I hope that the time will come when we do not have to secure the renewal of annual pledges, but that membership will be continuous and bills be rendered for dues without the necessity of securing new pledges each year. I ask that for 1928 you give us your pledges promptly for at least the amount you have pledged previously.

Co-operation with N. P. T. A.—"One thing which I hope may be brought about in the future is closer co-operation with the National Paper Trade Association and with the several organized converting groups. These organizations largely control our distribution problems. They are our salesmen.

"The National Paper Trade Association has under way a campaign of national advertising of paper. This is the outgrowth of several years of hard work on the part of their marketing committee. This plan should have our co-operation. Advertising is made possible through the use of our products, and the increased use of our products should be made possible, through advertising.

"Costs in this industry may reach the irreducible minimum and the spread between present costs and that ideal condition amounts to but a comparatively small amount. Our hope and the hope of our distributors lie in the development of new uses and increased use for the purposes now known to the industry. The problems of the producers and the distributors are much alike and they too, are faced with an 'over production' in potential sales capacity, which is bound to react on the producer through the competition which exists in the resale of his products.

"There is only one boat in this industry and every one who has anything to do with pulp or paper is in it.

"I do not want to leave the impression that the immediate outlook in the paper business is not good. I believe that 1928 will show a greater consumption of pulp and paper products

MORE THAN ONE HUNDRED PULP BLEACHING UNITS NOW OPERATING OR BUILDING.

These units have a capacity of nearly 2000 tons of bleached pulp per day, of which 350 tons per day is two-stage operation.

Fourteen units under construction in January, all for additions to plants of old users.

Pulp Bleaching Corporation

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than in any previous year. This may not be true of every branch of the industry but total consumption of all grades will, I believe, show an increase. Whether we make this a profitable year depends on the common sense which we and our distributors display in the production and sale of our products.

"In conclusion, permit me again to urge your generous financial support of our present form of association during the coming year. I feel confident that out of the discussion which should follow the suggestion of some change in form of the association, there will come many constructive ideas which will be adopted and made a part of our present activities. Even if we do not eventually change our association structure, I am sure that with adequate financial support we can render better service to our members than ever before. That we can, through co-operation with our affiliated associations eliminate some of the duplication of effort and definitely allocate certain classes of work which can be better performed by one than the other. It should be the aim of this association and its affiliated associations to work these things out on a commonsense basis so as to save expense and yet render equally as valuable or better service than heretofore.

"In other words, I hope we will not see a falling off in interest or support of the present association, simply on account of the suggestion of a new form, but let us carry on in the same manner as heretofore and allow the proposed committee to work out a plan to be presented later. I am confident that with your continued active support the association will render a better service than ever before, through the natural development of plans and classes of work which have been under way for some time and the adoption of new suggestions which may come to us.

"I trust that when the resolution is presented providing for the appointment of the committee you will take favorable action and let us see what can be suggested to improve our position in the present industrial situation."

Committee of Five Provided

On motion of Norman W. Wilson the president was authorized to appoint a committee of five to consider the recommendations of President Everest concerning the reorganization of the association and report to the Executive Committee which will then call a special meeting in the fall or bring it up for action at the regular annual meeting next year.

Economics of the Industry Discussed by a Banker

O. H. Cheney, vice president of the American Exchange Irving Trust Company, New York, was then invited to present a prepared address on "Economics of the Paper and Pulp Industry."

Mr. Cheney's address was one of great interest and received the close attention of the largest gathering of members and visitors that has attended a general meeting of the association for twenty years or more. The Astor Gallery in which the meeting was held was filled nearly to capacity, a circumstance which indicated the popularity of meeting early in the week.

Thinks Well of American Paper and Pulp—Mr. Cheney began by expressing his conviction that the American Paper and Pulp Association was one of the most progressive of trade associations, in spite of the fact that it was one of the earliest. He had given a good deal of attention to trade associations and their work and could say that there are a few in the field which showed such vital activity as the one he was addressing, and association work lay at the very heart of the prosperity of the pulp and paper industry. Continuing, he said, in part:

Differences in Industries—"If you compare two businesses in the same field, one a leader and one of the general run, you will find that the essential differences between them are in many ways more significant than the differences between two entirely different industries. The vital differences—those upon which the prosperity of industries and of the country depends—are the differences between the efficient and the not-so-efficient. This difference is really in the gap between what we know and what we are. The more advanced an industry is, the more rapid has been its progress in intelligence, the clearer that gap becomes. In less advanced industries there is a general air of hopelessness—they just don't know any better. But in an industry like yours, there is something more irritating in the contrast between the two pictures.

"It is probably truer to say that without paper there would have been no age of steel than to say that without steel there would have been no age of paper. The paper industry is the greatest industry based on the idea of democracy. The right to things has never been denied in any age, even those of tyranny. Even slaves had things, even if they couldn't have flivvers. But the right of all to know and to have ideas was denied before democracy. Without the democratization of education, there would have been no paper industry.

Advertising and Paper Manufacture—"It is a fundamental fact that the paper and pulp industry is what it is today because of the growth of advertising. The prosperity of the paper industry is bound up with faith in advertising—the faith of the business man who uses it and the faith of the consumer who reads it. Any marked change in the consumer acceptance of advertising or in the attitude of business towards those types of advertising which use paper must vitally affect the paper and pulp industry. The paper industry is economically on a sound basis so long as advertising is on a sound basis. The chief reason why we now use nearly twelve times as much newsprint per capita as we did fifty years ago is advertising. Advertising is the reason why a New York newspaper uses up about two thousand acres of forest a year.

A Question—"It is true that the paper industry changed its principal raw material within a generation. But it is also true that in less than a generation it reversed its sources of raw material and its imports of newsprint exceeded its domestic production. Is this because of the inadequacy of American sources or potential sources of wood? Attempts are being made to develop new raw materials—straw, cornstalks and sugar cane. Why is it that these attempts so often fail to take into account the elementary economics of continuous and adequate supplies, so that they have to fall back on wood? The paper and pulp industry uses only about 4 per cent of the country's lumber, so that there is plenty of potential supply. The recent development of kraft paper manufacture from Southern pine woods is an example of what can be done. Why has the American paper and pulp industry allowed its vital raw material to be at the mercy of so many influences beyond its control?

"The industry is quite thrilled at the idea that wood is being used increasingly in the remarkably growing industry of rayon, crowding out cotton as a raw material. But have we stopped long enough to consider thoroughly all the possible results of this trend? When paper and rayon seriously begin to compete for the same raw material, will the economics of the paper industry remain what they are now?

Study Basic Statistics—"And what of pulp production and paper manufacture? Is there not a little too much of a Jack Horner sitting in the corner attitude of self-satisfaction with both the economics and technology of production? It would be more than a simple and harmless way of killing a little time for everybody in the industry to study the basic statistics of its growth in the last thirty years—and try to understand clearly the meaning of those figures. There were exactly the same number of paper and woodpulp mills in the country in 1899 and 1925—763—and you can call that a coincidence if you wish. But the number of workers in the industry was multiplied by 2½ in that quarter of a century the power used was more than tripled; the wages were multiplied almost by 8; the total cost of materials used was nearly 9 times as great, and the value added by manufacture was 8½ times as much.

Mergers and Consolidations—"I need not tell you of the persistent trend towards mergers and consolidations in your industry and of the increasing complexity of the international ramifications of the leading units. It was inevitable, also, because of the vital necessity for huge volumes of water in the manufacturing process, that those in the industry should go into the power field. In fact, as paper manufacturers, some concerns have naturally become good power producers. The

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reason why I bring up these two developments is that, while they are inherently sound, they have also been a source of confusion to the economics of the industry. Is it inevitable that constantly growing aggregations of plant and capital in the industry mean better profits for the whole industry? Does a plant have to be a big plant and a growing plant to be efficient and profitable? And of what benefit is it to the paper industry as a whole if some plants can sell pulp and paper at a loss and still make money by selling power?

The Need for Scientific Research—"Being one who has to deal with abstractions like figures, I am naturally a little awe-struck in the presence of the realities of chemistry and mechanics. Even a layman can appreciate the tremendous technological progress which your industry has made. And yet I must confess to being perturbed at the idea of the continued existence of a problem like that of the 40 to 50 per cent loss of raw materials and like that of stream pollution. And the fact that the paper industry uses relatively more raw material than any other important industry—four tons of coal, wood and chemicals for every ton of paper—must, it seems to me, be a standing challenge to the technicians of the industry. I know you have chemists and laboratories, but how many of them are doing merely routine control work and how many are doing real, fundamental and constructive scientific research? In how many plants is the chemist in reality only little more than tolerated? And have you given serious thought to the possibilities of a good chemical engineer and research man, with an outside point of view and imagination, being given a free hand in your plant for a year?

Menace to the Industry—"How can facts be used to overcome the constant menace of overproduction? I don't know what the Department of Justice, the Federal Trade Commission and Congress have decided in the last five minutes on the proper use of trade association statistics. But the paper industry is here confronted with the identical problem of most other industries. It must take thought and action to work out its own destiny—but there is just as urgent a duty to all American business, to our whole economic existence, for all industries to join together on some rational and legal and sound economic program for meeting this problem.

Abuses Are Not Due to Age—"Many business men in the older industries, like textiles or hardware or paper, have come to feel that all their distribution problems arise from the age of the industry—that abuses grew up and have clung to the practice of the trade because they have become woven into its traditions. They often envy the newer industries which have no old and unsound trade customs. Their envy is wasted. The newer industries have nothing to learn from the old ones because they have learned everything, particularly what they shouldn't have learned. A new industry quickly adopts not only the abuses of the older ones but improves on them—on their intricacy, on their unsoundness and on their demoraliing burdens on legitimate methods. No industry has more difficult distribution problems and more trade practices of which the trade would like to get rid than the automobile and radio industries."

Suburban Amenities—In referring to trade association co-operation between competitors, Mr. Cheney touched a lighter note. He said that in many trade associations the spirit was too much like that of two commuters known to him. They met on the station one morning and greeted each other cheerily. "I'm sorry, old man," said one, "One of my hens crawled into your garden and scratched up some of your seeds." "Oh, that's all right, old sport," said the other, "don't worry, my dog ate your hen." "Well, that's bully," was the reply, "I just ran over your dog."

After thanking the speaker, and Secretary Porter had made several announcements, President Everest called on Ernst Mahler, vice president of Kimberly-Clark Company to give his address on "Technical Control in the Pulp and Paper Industry."

Plant Operation Problems

Mr. Mahler spoke largely without notes. In introducing him, President Everest had referred to him as an expert, and Mr. Mahler was prompt to disavow the soft impeachment, saying, "I am not an expert. I hate experts." He also disclaimed any intention of trying to preach a sermon or to reform the management of our industry. All he aimed at was to tell from a cold business standpoint, and from fifteen years of experience what his views were as to the management of the manufacturing division of any pulp and paper mill. The text of Mr. Mahler's speech is reproduced elsewhere in this issue of THE PAPER INDUSTRY.

To the reporter, it seemed quite in the logic of events that Mr. Mahler should be chosen this year to make the principal address before the American Paper and Pulp Association on "Technical Control in the Pulp and Paper Industry", for it is well known to the original members of the Technical Association of the Pulp and Paper Industry that he was the guiding spirit of the organization in the early days when it was known as the Technical Section of the American Paper and Pulp Association. He has a straightforward and at the same time scholarly way of looking at events and directing affairs that make him a most dependable man where questions of both technology and ethics are concerned.

His address occupied forty-five minutes in delivery, lasting from 12:15 to 1 o'clock. At the close he was roundly cheered and President Everest thanked him on behalf of the association for his able presentation of plant operation problems. The forenoon sitting was then adjourned.

AFTERNOON SITTING

The afternoon session was held in the Myrtle Room of the Waldorf-Astoria. President Everest was again in the chair, and was assisted by Secretary Porter.

Policies in Waste Utilization and Stream Improvement

The first speaker called upon was Clarence M. Baker, engineer of the American Paper and Pulp Association in charge of waste utilization and stream improvement, who read a paper on this subject. Mr. Baker pointed out that the primary purpose of the Committee for the Reduction of Waste and Stream Improvement was to save money for the paper mills by preventing the discarding of materials which could be used.

Delay is Dangerous—In states or localities where an aggressive movement had not been started it would not be good policy to agitate the question of stream pollution, but it was important to realize that the problem did exist and prepare for its solution. Sooner or later it would become a live issue in all states and localities and industry should be in a position to seize the initiative. Unnecessary delay was dangerous because reactionary public opinion might result in radical legislation and policies which would entail hardship to the industry. Although the notion prevails in some quarters that industry is doing little or nothing toward a solution of its stream pollution problem, millions of dollars are actually being expended in waste utilization and stream improvement. The committee's efforts are being warmly approved by the officials in several states and the authorities know that the paper industry can be counted upon to do its share in preventing the contamination of the streams from which the necessary power is derived.

Mr. Baker cited a number of specific cases where paper mills had spent large sums to prevent the contamination of streams, and told how this expense could readily have been distributed among groups of mills. He instanced the recovery of waste sulphite liquor as an outstanding example of individual endeavor in research. One mill in Pennsylvania had spent $250,000 in the construction of a plant for utilization of this waste, and it had proved a failure. Recently a California mill had spent upwards of $200,000 in development and research which had also proved valueless. Instances of waste utilization by individual mills were cited which had contributed to the financial advantage of these mills and eliminated the necessity of stream improvement.

Conclusions and Recommendations—In concluding his address Mr. Baker stated his conclusions and recommendations. He recommended that committees representative of the pulp and paper industry be organized in each manufacturing state. Mills should initiate a regular program of sampling and analyzing their waste, either individually or in connection with state officials. The data obtained in this way would not

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only indicate the extent to which the mill might be a factor in stream pollution but also point to opportunities for the operation of profitable recovery processes.

RESOLUTIONS

Milton E. Marcuse, of the Bedford Pulp and Paper Company, Richmond, Va., chairman of the Resolutions Committee, then submitted the following resolutions, each of which was approved separately after Mr. Marcuse had finished reading it:

In Memoriam

Whereas, In the wisdom of Almighty God, leaders of the industry have been taken from our councils during the past year,

Be It Therefore Resolved, That the Association voices its sorrow at their loss, and its appreciation of their constructive work for the industry:

Among those are:—

Charles B. Bird, Bird & Son
Robert Gair, Robert Gair Co.
John A. Kimberly, Kimberly-Clark Co.
Eugene Maurer, Central Paper Co.
Lawrence E. Nash, Nekoosa-Edwards Paper Co.
James W. Oakford, Cherry River Paper Co.
Matthias Plum, Jr., Waverly Paper Board Co.
Garrett Schenck, Great Northern Paper Co.
A. H. Scott, Scott Paper Company

Dr. Hugh P. Baker

Whereas, Dr. Hugh P. Baker has been signally honored by the Chamber of Commerce of the United States in his appointment as head of its new Trade Association Department, and

Whereas, Dr. Baker has ably handled the affairs of the Association during the past eight years,

Be It Therefore Resolved, That this Association expresses its appreciation of his aggressive service in the interests of the industry, and wishes him all possible success in his work.

National Paper Trade Association

Whereas, There are two elements essential to the success and progress of the American Paper industry, namely, the manufacturers and the merchants, and

Whereas, The paper merchants of the United States are organized through the National Paper Trade Association, and

Whereas, The National Paper Trade Association is now celebrating its Silver Anniversary—twenty-five years of organized service to the paper industry,

Be It Therefore Resolved, That the American Paper and Pulp Association in convention assembled at its 51st Annual Meeting, does hereby extend its congratulations to the National Paper Trade Association and best wishes for continued success.

Forestry

Whereas, The Paper Industry of the United States is a wood-using industry, with growing dependence on the productive capacity of American timberlands, and

Whereas, There is ample forest land in the United States to furnish the raw material for the wood-using industries of the country in perpetuity if protected from fire and properly managed, and

Whereas, The practice of forestry by the Paper Industry is in reality a business problem involving equitable taxation and adequate returns on invested capital, and

Whereas, Aggressive leadership is needed to secure the necessary fundamental research for the application of practical forestry to sustained production,

Be It Therefore Resolved, That the Association, in recognizing the necessity for aggressive leadership for the solution of this problem, recommends active support of its Woodlands Section as the means of crystalizing action by the paper industry to this end, and furthermore does hereby record its unqualified approval of the pending legislation covering adequate forest research, known as the McSweeney-McNary Bill.

Taxation

Whereas, Economy in federal and state administrations should be continued, and

Whereas, It is evident that their present efficiency can be maintained, with some general tax reduction,

Be It Therefore Resolved, That the American Paper and Pulp Association recommends that as rapidly as budgetary necessities permit the federal tax rate applicable to corporations be reduced to a figure not in excess of 10% (or to an equalized rate in case of any change in the rate schedule of the personal income tax) and

Be It Further Resolved, That the Association recognizes that the extent of any reduction in this tax must be governed by the state of the Treasury and the surplus balances available in the near future for such reduction; and, since the United States Treasury, through its Bureau of the Budget, is the only agency which has at its disposal all the facts necessary to estimate future surpluses over normal expenditures, the Association indicates its approval of action following the estimates of the Treasury as guiding in this matter.

Waste Prevention and Stream Improvement

Whereas, One of the larger common problems confronting the Paper Industry of the United States today is that of waste prevention, and

Whereas, This involves efforts on the part of individual mills, communities, states and the Federal Government, to prevent unnecessary waste and stream pollution, and

Whereas, The Association has realized the necessity of attacking this problem on a broad, co-operative basis, through the employment of a trained, sanitary engineer,

Be It Therefore Resolved, That the Association records its desire to develop the closest possible co-operation with other agencies, and particularly with state officials studying this problem, and stresses the necessity for adequate financial support of this work, under the direction of its engineer, Mr. C. M. Baker.

Costs

Whereas, Modern Competition demands the greatest efficiency and lowest possible costs consistent with quality and service, and

Whereas, There appears to be some lack of appreciation of the value of adequate and uniform cost accounting methods throughout the Industry, and

Whereas, The Cost Association of the Paper Industry is well equipped to carry on educational work looking towards the general adoption of practical cost accounting methods,

Be It Therefore Resolved, That the Association approves the work of the Cost Association and urges its support generally by the Industry.

Foreign Trade

Whereas, There appears to be opportunity to develop foreign markets for the paper industry of the United States,

Be It Therefore Resolved, That the Association favors co-operative efforts to stimulate foreign demand and increase foreign trade, and requests the most active co-operation of the United States Department of Commerce through its Paper Section of the Bureau of Foreign and Domestic Commerce in facilitating this work.

Official Rules For Weighing, Sampling and Testing Wood Pulp

Whereas, A Joint Committee representing the American Paper and Pulp Association, the Association of American Wood Pulp Importers and the Technical Association of the Paper and Pulp Industry, has prepared tentative rules and regulations looking towards a high, uniform standard of pulp sampling and testing, and

Whereas, This committee's Rules have been accepted generally throughout the industry;

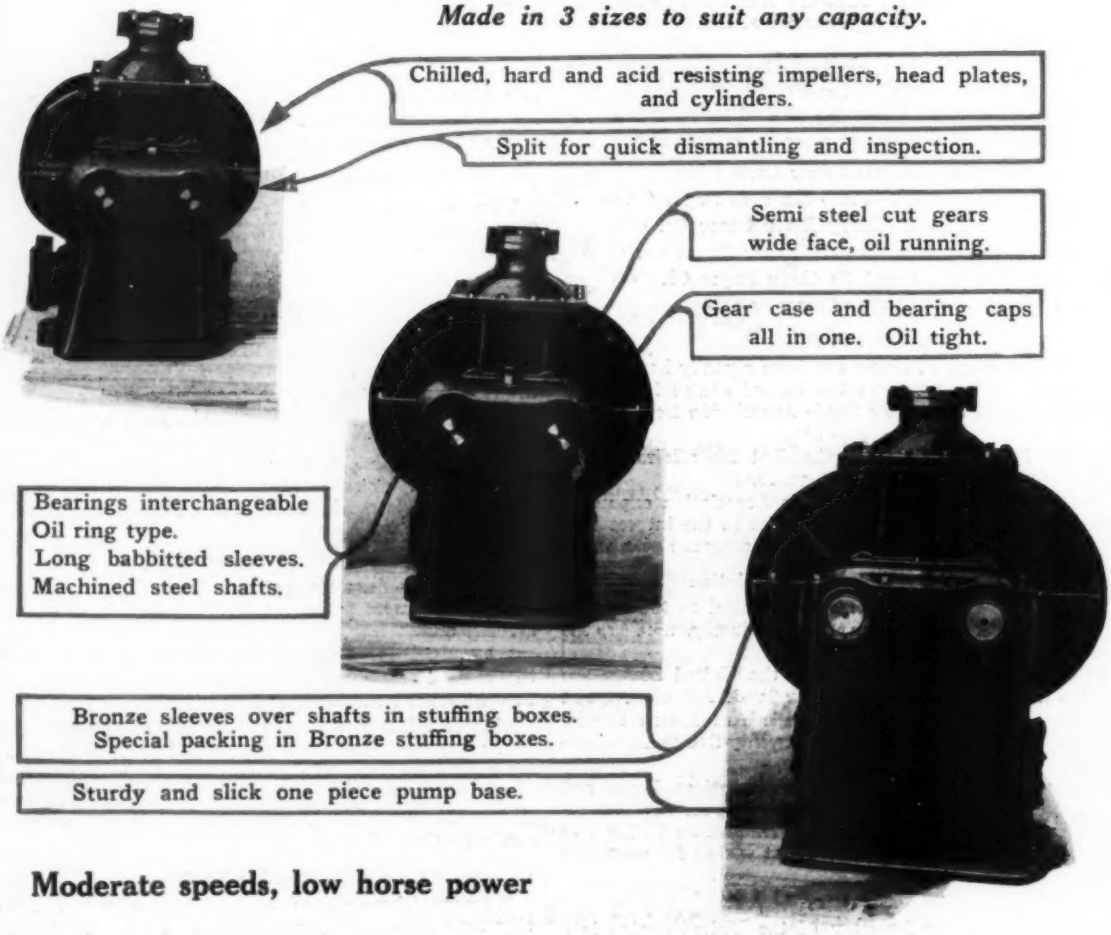
Be It Therefore Resolved, That the Association formally approves and adopts the Rules and Regulations for Weighing,

THE NEW "SANDUSKY" STUFFPUMP

CYCLOIDAL IMPELLER TYPE

A dependable Stuffpump for all kinds and all densities of stock.

Made in 3 sizes to suit any capacity.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The Paper & Textile Machinery Co.

SANDUSKY, OHIO

Sampling and Testing Woodpulp as proposed by this Joint Committee.

President Rooney Speaks for the Superintendents

Following the adoption of the resolutions President Everest introduced Fred J. Rooney, president of the American Pulp and Paper Mill Superintendents' Association, who was on the program to give an address on the purposes and activities of his association.

Mr. Rooney said that he as president of the Superintendents' Association believed in co-operation in its truest sense with all branches of the mill organization, and emphasized that there had been a large increase in the productive ability of paper mills brought about by such co-operation and interchange of ideas between the supers and mill executives. He suggested that the paper company executives insist upon their superintendents attending all meetings of the Superintendants' Association, and on their return from the meetings that the supers be required to file a report on the happenings and discussions at the meetings, which, as is the situation in his individual case, insures the superintendent getting all the benefit possible out of the association meetings and justifies the expense entailed by the mill in being represented at such meetings. He cited the following results of the interchange of ideas between superintendents at their association meetings: Greater efficiency, better quality of product, increased tonnage, reduced weights, reduction in accidents, and more accurate knowledge of mill equipment.

A Lawyer Expounds the Law of Combinations

Henry A. Wise, attorney with the firm of Wise, Whitney and Parker, of New York City, and widely known in the paper industry through his legal efforts on behalf of the Import Committee of the Paper Industry, was then introduced by President Everest. Mr. Wise spoke on "Lawful Combinations in Industry," and covered his subject from the proverbial alpha to omega. He began by saying that his subject was so comprehensive and the questions involved so technical that he would attempt to give only a brief outline. He told how back in the eighties combinations in business were becoming so numerous that the American public demanded legislation prohibiting such combines, thus bringing about the Sherman Anti-Trust Act, passed by Congress in July, 1890, and which denounces practically every combination in industry and provides punishment by fine or imprisonment to those violating it.

Mr. Wise reviewed virtually every important court ruling on the anti-trust law during the last thirty-five years, enumerating them as they were recorded, and commenting on the various interpretations of the Act by the United States Supreme Court during this space of time. He told of the series of prosecutions waged against trade associations by the government, and said that these litigations had been brought under nearly every form of trade organization. He pointed out that but two decisions had been rendered which might be said to be definitely antagonistic to trade groups, and these were limited to particular facts therein involved. He told how Secretary of Commerce Hoover had sought to clarify the situation as regards trade associations and had called a conference in Washington at which 600 trade organizations were represented, and said that this conference did much to clarify the situation. He ended by stating that the prevailing view of the government is in the direction of accepting the sound economic principles underlying the operations of trade associations conducted along legitimate lines, but that in any case where upon the particular facts it can be said that the dominant purpose and effect of the practices involved will result in a direct and unreasonable restraint of interstate or foreign trade and commerce, that such practices will meet with disapproval.

Walter J. Raybold, of the B. D. Rising Paper Company, Housatonic, Mass., chairman of the Nominating Committee, then read the committee's selection of proposed officers of the American Paper and Pulp Association for the ensuing year, and on motion it was voted to elect the ticket as nominated with a single affirmative vote, thus making the election unanimous. The names of the officers elected are as follows:

Officers for 1928-29

President, D. Clark Everest, of the Marathon Paper Mills, Rothschild, Wis.

Vice Presidents, Sidney L. Willson, of the American Writing Paper Company, Holyoke, Mass., and Felix Pagenstecher, of the Bryant Paper Company, Kalamazoo, Mich.

Secretary and Treasurer, Oliver M. Porter, of New York City.

Executive Committee: Norman W. Wilson, of the Hammermill Paper Company, Erie, Pa.; J. P. Hummel, of the Hummel-Ross Fibre Corporation, Hopewell, Va.; Hugh J. Chisholm, of the Oxford Paper Company, New York City; Milton E. Marcuse, of the Bedford Pulp and Paper Company, Richmond, Va., and W. L. Carter, of the Nashua Gummed and Coated Paper Company, Nashua, N. H.

This concluded the business before the association and the meeting was adjourned.

The Paper Manufacturers' Banquet

The attendance at the fifty-first annual dinner of the American Paper and Pulp Association, which was held at the Waldorf-Astoria, New York, on Thursday, February 23, nearly equaled in numbers that of the Golden Jubilee dinner a year ago, and the interest taken in the proceedings was not less keen. Every table in the Grand Ball-room of the hotel was occupied and the balconies accommodated an overflow. The banquet hall presented a gala appearance with festoons of bunting and stands of flags. Back of the speakers' table were grouped fifteen immense national standards, surmounting three separate flag staffs of the City, Nation and State respectively. At each table was laid an artistic book of the menu which had as frontispiece an etching of the old Rittenhouse mill as it stood in 1690 near Germantown, Pa. In addition to the menu and list of speakers the book contained a list of the officers, executive committee and banquet committees of the association, besides a complete enumeration of former presidents and the years they held office.

At the Speakers' Table—At the speakers' table presided over by D. Clark Everest, who acted as toastmaster, sat the guests of honor, including Judge Marvin B. Rosenberry, Rev. Dr. Nehemiah Boynton, Henry A. Wise, J. C. Mallalieu, S. L. Willson, Norman W. Wilson, W. N. Gillett, Magnus W. Alexander, Felix Pagenstecher, A. G. Paine, Jr., M. E. Marcuse, Harry W. Mathewson, Henry W. Stokes, Arthur C. Hastings, George W. Sisson, Jr., F. L. Stevens and Dr. Hugh P. Baker.

Introducing the Speakers—After the coffee was served, Toastmaster Everest started the speechmaking with a word of felicitation to the National Paper Trade Association which is this year celebrating its twenty-fifth anniversary. He then expressed regret at the unavoidable absence of Col. C. H. P. Jones, president of the Canadian Pulp and Paper Association. Another absentee greatly missed was Judge Charles F. Moore whose latest literary production, "Praise of the Present," had just been published and for which President Everest said he hoped there would be a big generous demand. Judge Moore had always been a helpful friend of the industry and liberal in his services and he therefore bespoke a liberal response on the part of the members to his appeal for Judge Moore and the sale of his new book.

Token of Esteem for Dr. Baker—President Everest then made allusion to the resignation of Dr. Hugh P. Baker as secretary-treasurer of the association and announced that he would ask former president George W. Sisson, Jr., to express the appreciation of the association of his services, which Mr. Sisson did in a speech of great eloquence in which he paid a splendid tribute to the "able, farseeing and constructive work" of Doctor Baker who had entered the service of the association at the time he held office in 1918. He then presented him with a handsome silver service which had been subscribed for by a number of members as a token of the regard and esteem in which they held the recipient.

In responding, Doctor Baker appeared to be deeply affected and his voice broke. He was evidently profoundly touched both by the words of presentation and the gift itself. He

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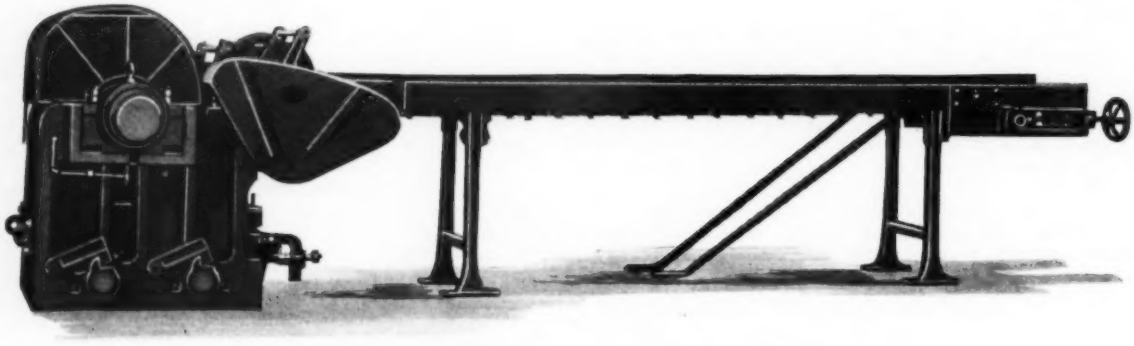

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Stock Can Be Cut as Fine as Desired
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Pulp Shredders Disc Choppers
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RAG CUTTER KNIVES

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said he had deemed it sufficient reward to work with the finest body of men with whom he had ever had relations, and it would make no difference to him what fate might hold in store for him or what new contacts he might make, he would always cherish the fondest recollections of his pleasant associations with the paper manufacturers of the country and hoped he could be of assistance to them in his new position with the United States Chamber of Commerce, where he would be always at their service.

In introducing Justice Marvin B. Rosenberry, Justice of the Supreme Court of Wisconsin, the toastmaster intimated laughingly that they must not expect Judge Rosenberry to be the type of Wisconsin Republican they were accustomed to find featuring the news from Washington, an allusion which was not lost on the audience.

The Interstate Commerce Commission—Discussing administrative law and business, Justice Rosenberry touched on some of the fundamental changes which are taking place in the structure of the legal system and political theory in the United States. His address constituted a most valuable historical study of the exercise of executive legislative and judicial authority. Of special interest to merchants and manufacturers was his exposition of the development of extra-constitutional governmental agencies, the first of which was the Interstate Commerce Commission. This commission, Judge Rosenberry said, "created by an Act of Congress had developed within thirty years into one of the most powerful agencies of the government, directly controlling and influencing operations of carriers and shippers vastly greater in extent than the operations of the government itself.

What of the Future?—"The boards, bureaus and commissions that have followed have been charged with executive responsibilities comparable only to those of one of the great cabinet ministers, and because this body of administrative law has burst the bonds of constitutional restraint, its future development is largely unpredictable." With respect to the future he would say nothing; it was his purpose to present a picture of an existing situation in the hope and expectation that the interest of his hearers might be aroused.

The Duty of a Citizen—In closing, Judge Rosenberry said it was the duty of every citizen to give some part of his time and talents to the public service. "The development of administrative law opens a way by which our government will tend more and more strongly away from the constitutional to the parliamentary system. We should recognize the facts as they exist, realize the inevitableness of the further growth and development in this field of governmental activity and endeavor, not in our individual or personal interests, but in the interest of the general welfare to so guide it, and so limit and circumscribe its development that it will be an aid to further progress and not a Frankenstein monster which may destroy its creator."

Introducing Chaplain Boynton—Toastmaster Everest introduced the next speaker, the Rev. Dr. Nehemiah Boynton, as "clergyman, lecturer, author and chaplain of the Thirteenth Coast Defense Artillery, N. Y., and of the American Paper and Pulp Association."

Pays Tribute to Charles E. Hughes—Doctor Boynton was in his usual merry mood, and in an address blended with patriotism, morals and economics, as benefitted the day following Washington's birthday, he spoke of the development of personality in great business enterprises. If a business was not characterized by personal development, no matter how great the production might be, there would be something lacking. He instanced Charles E. Hughes and his recent diplomatic work in Cuba as an evidence of the royal character of his patriotism as an American citizen.

A speech by Doctor Boynton would be unrecognizable without one of his sallies of wit and humor. In the introductory part of his speech he instanced the American who, gazing on an eruption of Vesuvius for the first time, said, "This beats Hell," and the Englishman standing by who heard him and remarked, "My word! how widely you Americans do travel."

Technical Association Annual Meeting

Report of the Proceedings with Abstracts of Papers and Discussions

INSTEAD of a three-day session as has been customary since its organization, the Technical Association of the Pulp and Paper Industry this year crowded a fairly extensive program into two days of meeting. The sessions were crowded in more than one sense, for the bedrooms and antechambers reserved for meetings of standing committees at the Waldorf-Astoria were packed so tightly on some occasions as to make it difficult to get in or out of the rooms.

President's Annual Address

The thirteenth annual meeting was opened at 9:30 A. M. in the Myrtle Room of the Waldorf-Astoria on Wednesday, February 22, with President E. C. Tucker in the chair. After the usual greetings, the program of meeting was begun, the first item being the annual address of the president. In this President Tucker discussed the growth in membership during the past year, the work of committees, prevention of stream pollution and the Minton vacuum drying system.

Service to Members—President Tucker spoke in commendation of the work of the association under the Service to Members plan. During the year more inquiries and reports relating to this work had been handled than ever before. He likened the plan in one of its workings to one of our great national indoor sports, in that every member who would take part must first ante. On the other hand it differed from poker in that everybody who antes is bound to win. He urged the members to get in touch with the secretary and tell him on what subjects information was desired in order that they might receive the special inquiries and ante with their own views and opinions. There was no other way to get the benefit of the service, except by inducing the company for which a member worked to become a corporate member.

Mr. MacNaughton's Resignation—In reference to the resignation of Mr. MacNaughton as secretary, he said that he had brought to the association a wide knowledge of both men and processes as well as an earnestness and sincerity of purpose which had contributed largely to its growth and prestige. Of his successor, Mr. Macdonald, who is a graduate of Massachusetts Institute of Technology, said that the start he had made on the work of the association was a good augury of its continued growth.

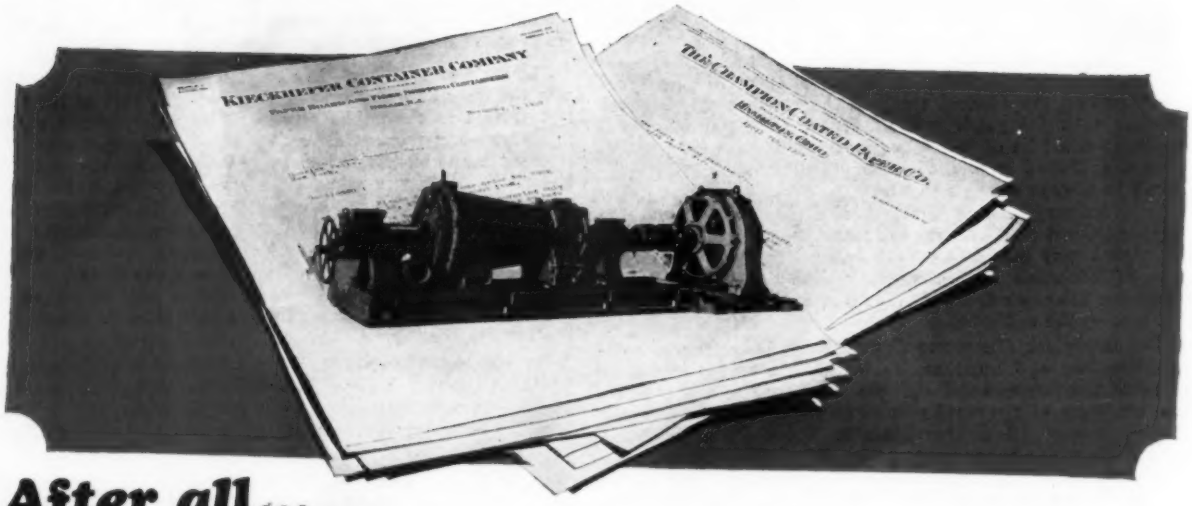
After observing that Ogden Minton, a member of the association, had rendered outstanding service to the industry through his invention of the vacuum dryer and deserved the commendation of the association, he paid tribute to W. O. Mason for his work on the Masonite process.

Report of the Secretary

Following the reading of the President's address, Acting Secretary Macdonald read the report of the secretary, which he said should be regarded as "a weighted index of the records of the Technical Association for 1927". He gave credit to Mr. MacNaughton for 95 per cent of the work of the secretary's office during the past year.

Reporting on gains in membership, he said that 101 new members had been elected during the year, but the net growth of membership was 50, since 51 resignations had been received. The total number of members on December 31, 1927, was 761, composed of 504 active members, 161 associate members, and 96 juniors. In addition to this, the association has 56 corporate members.

An enumeration was made of thirty-four special T. A. P. P. I. reports on technical and manufacturing problems issued during the year.



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Our files are crowded with interesting "back-pats" from paper-makers who have invested in NOBLE & WOOD equipment,—producers of every variety of paper from finest tissue to heaviest wall board. They tell a story of years of dependable performance, with "satisfaction" emphasized again and again.

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Fall Meetings—In reference to the meetings of the association which are held in the fall of the year, it was noted that these meetings comprised plant inspection trips, recreation and discussion of problems of common interest.

New Committees—In reference to committee activities it was noted that three new committees had carried on important work—the Committee on Stuff Preparation, Roofiing Felt and Mechanical Handling of Material.

The subject of waste utilization and stream improvement received attention in a reference to the appointment of Clarence N. Baker, as engineer of the American Paper and Pulp Association, and it was observed that "the great quantity of data that has been compiled by the Technical Association will be of material assistance to the mills that co-operate in the solution of the problems."

Training for the Industry—On account of a confused understanding of the purpose of the Committee on Training for the Industry, Secretary Macdonald deemed it advisable to say that it was concerned with the preparation of men in the technical schools for work in the industry. To attain this end, men representing the industry made addresses from time to time to students in colleges in which the technical and production of the industry were defined. During summer vacation periods, an effort was made to place students in temporary employment in pulp and paper mills so that they might become intimately acquainted with practical operating procedure.

Power Problems—The report said that the broad field covered by the Heat, Light and Power Committee of the association enabled it to deal with the many ramifications of the problem of power and steam generation and distribution. It was noted that there was an apparent need for more specific information relating to the amount of power required to drive equipment, expressed in terms of a ton of product prepared in one hour.

Receipts and Expenditures—In a statement of income and expenditure for the year ended December 31, 1927, it was stated that the income from dues and entrance fees amounted to $16,185, divided into $9,600 from active and associate members, $5,600 from corporate members, and the remainder from dues of juniors, entrance fees and reinstatements. A net return of $5,499.31 was reported from the sale of miscellaneous papers and reports and advertising, the last named item amounting to $7,185.30, the difference being charged to cost, which amounted to $3,699.53, on the total of $9,198.84. Sales of textbooks amounting to $1,297.19 were made at a cost of $1,133.80, leaving a net profit of $163.39. Income from "editorial services" was stated at $1,519.77. The total income for the year, including interest on bonds and bank deposits amounted to $23,838.35.

The total expenditures for the year amounted to $20,569.99, which left a balance of $3,268.36. The chief items of expenditure were salaries $12,335.50 and subscriptions to **Paper Trade Journal** $3,039.54.

After a pleased comment on the state of finances the chair appointed a committee on nominations for officers to report at next day's sitting consisting of W. S. McClellan, C. C. Heritage and John Traquair.

Reports of Committees

R. S. Kellogg was invited to make a statement for the Joint Vocational Educational Committee on the sale of textbooks and condition of the textbook funds. Particulars of these were given in the February issue of THE PAPER INDUSTRY on page 1866.

Reports of committees were then called for and several chairmen responded during the course of the forenoon.

Clarence J. West gave an account of his work as chairman of the Committee on Abstracts and Bibliography. He asked the indulgence of the members for delay in the publication of the collective bibliography of papermaking materials, explaining that this was caused by physical difficulties attendant on a personal search of many paper trade publications for references.

The committee is prepared to supply photostats of magazine articles at the rate of 15c a page, or two pages for 25c, which is a low price. After mentioning that the National Research Council by whom Doctor West is employed, was co-operating with T. A. P. P. I. to the extent of allowing him to concentrate on the bibliography of papermaking materials for half a year, it was suggested by the chair that George K. Spence be asked to draw up a set of resolutions expressive of the association's gratitude to the National Research Council.

Sulphite Pulp Tests

G. P. Genberg, chairman of the Committee on Sulphite Pulp reviewed the work of the committee which had been continued the past year in close co-operation with the Committee on Physical Standards of the Canadian Technical Section with a view of devising a method of testing sulphite pulp which could be used as a standard on the American continent. Progress was reported on the plans for international co-operation. A suggestion has been made that an international conference of representatives of the technical sections of pulp producing and consuming countries and it was suggested that an official representative be appointed to an eventual international conference. It was also recommended that a new committee on Physical Standards for Pulp be formed. It was said that the work connected with measuring the physical properties of pulp was of such magnitude that it would justify the appointment of such a committee.

In reply to questions it was explained that there would be two standard methods, one for determining the initial strength of pulp and the other a beating strength test. Some objection was made to the adoption of the committee's initial strength test because it would necessitate some radical changes in existing equipment.

After a statement by George D. Bearce relating to his committee on Mechanical Handling of Materials, in which it was explained that considerable preliminary work had yet to be done, the report of the committee on Training for the Industry was called for. This was presented by Allen Abrams, chairman of the committee.

Work of Training Committee

Mr. Abrams gave details of the steps which in the opinion of the committee should be taken to provide closer co-ordination between the colleges and the pulp and paper industry. The committee had divided the country into nine co-operating pulp and paper mill areas and named members of the association to direct the work, and Mr. Abrams gave details of what had been accomplished in the different areas, all of which indicated excellent progress. A further report on progress will be made at the fall meeting. The areas, directors, and co-operating schools were named by him as follows:

Area No.	Director	State in Area	Co-operating Schools
1	T. F. Spear	Maine Massachusetts	U. of Maine Mass. Inst. of Technology
2	P. D. Bray	Vermont New Hampshire	U. of Maine
3	C. E. Libby	New York	N. Y. S. College of Forestry
4		Pennsylvania	———
5	J. D. Rue	North Carolina South Carolina Virginia	———
6	J. J. O'Connor	Ohio West Virginia	Ohio State University
7	B. M. Thomas	Indiana Illinois	Purdue University
8	H. L. Joachim	Michigan	U. of Wisconsin
9	H. G. Noyes	Wisconsin	U. of Michigan

Paper Testing Methods

The Paper Testing Committee, B. W. Scribner, chairman, reported having prepared material for a revised edition of the association publication called Paper Testing Methods. Three additional paper testing methods relating to the analysis of mineral coating, of mineral filler, and a test for folding endurance have been adopted. Two additional test methods, one for gloss and one for opacity are under consideration. It was mentioned that in an article published by Th. C. Bentzen in THE PAPER INDUSTRY for December, 1927, the value of the potassium ferrocyanide iron reagent was questioned.

Other committees reported briefly, outlining the character

L. M. ALEXANDER, President-Treasurer
JOHN E. ALEXANDER, 1st Vice President-Gen. Mgr.

C. A. JASPERSON, Secretary
W. E. NASH, Sales Manager

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NEKOOSA—	Paper, Groundwood, Sulphite, Sulphate Hydro Electric Power—35 million K. W. annually
Port Edwards—	Paper, Groundwood, Sulphite, Bleach Hydro Electric Power—10 million K. W. annually
South Centralia—	Hydro Electric Power—25 million K. W. annually
Nepco Lake—	Spring Water Pumping Plant Hydro Electric Power—5 million K. W. annually

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of the discussions to be carried on at committee meetings on the following day, George K. Spence thus reporting for Committee on Stuff Preparation and W. E. Baker for the Cellulose Committee.

Report on Roofing Felts

P. W. Codwise submitted a brief report of progress for the Committee on Roofing Felt. He said that a survey of testing methods for roofing felt was now under way and should be completed by the time of the next annual meeting. A preliminary investigation had been made of methods of disintegrating rag stock differing from the generally accepted ones of using the rag cutter, the beater and the jordan. The use of sling hammer disintegrators had been looked into without very encouraging results but the subject was still under consideration.

Conditions on the Coast

While waiting for Professor Scarth, of McGill University, to present his paper on "The Structure of Wood and Its Penetration," B. T. McBain was asked to speak on pulp and paper-making conditions on the Pacific Coast and he gave a glowing picture of conditions there, saying among other things that the States of Oregon and Washington have the largest resources of wood in the world that is suitable for the manufacture of white paper. He made the members open their eyes by statements concerning the diameter of pulpwood logs on the coast, which ranged from 2 ft. to 12 ft. and some larger, so that it was sometimes difficult to transport them in the ordinary conveyor.

A Botanist Looks at Pulping Problems

Prof. G. W. Scarth, of the Department of Botany of McGill University, made his appearance at this point and proceeded to describe the intimate structure of woods and the characteristics of fiber formation, using text and lantern slides for this purpose. Wood penetration was one of the questions now under study at McGill University through a new scheme of co-operative research with the pulp and paper industry in cellulose problems, the work being carried on under the general direction of Professor Hibbert.

The Nature of Wood—Professor Scarth demonstrated an interesting fashion that wood was not a mere bundle of fibers that cooking liquors can readily interpenetrate and isolate. It was a complex finally organized structure with intricate channels of communication, which may be either open or closed, but which must be open before penetration can take place. It was necessary to visualize the intimate structure of wood before conditions affecting its penetration by cooking liquor could be properly understood.

Is Wood Chipped Properly?—Professor Scarth is inclined to question whether the present method of chipping wood for pulping gives the best results. By means of slides showing the microscopic structure of the wood, he showed that the axial penetration of wood by liquids was rapid and radial movement practically non-existent. It would appear then that flat chips were not the ones best designed for penetration.

Wood Penetration—In some experiments with pinewood immersed in mercury and subjected to alternating vacuum and pressure the penetration path in soft woods was illustrated. In all experiments impregnation was confined to the sapwood, the heartwood being practically untouched. Where there is penetration, the mercury could be seen to have passed from tracheid to tracheid through the pits. Most softwoods have bordered pits. He showed a magnified view of a pit which he compared to a porch with a door on each side and a perforated screen stretching across the middle. When the screen is so placed, as it always is in sapwood, there is free passage for liquid flow, but in heartwood this screen is deflected to one side and blocks communication. The sapwood of spruce resists the penetration of mercury and is said to be impenetrable by creosote. The practical application of this research is that sudden high pressures in cooking wood are not productive of good results.

Professor Scarth, as one result of his demonstration, emphasized the fact that in all research on wood fibers, if one is to understand what is going on, the test tube of the chemist and the apparatus of the engineer must be supplemented by the botanist's microscope.

After a suitable expression of thanks to Professor Scarth the morning sitting was adjourned.

SECTIONAL MEETINGS ON WEDNESDAY

Wednesday afternoon was given up to sectional meetings of the Heat, Light and Power, Paper Testing and Cellulose Committees, respectively.

E. F. Troop president in the Myrtle Room over the proceedings of the Heat, Light and Power Section at which papers were read and discussed, as follows: Low Pressure Steam in Paper Manufacture, by W. B. Lewis; Waste Heat Recovery, by S. W. Fletcher; Pumping Paper Stock, by R. K. Annis and Starting System for Electric Sectional Drive, by R. R. Baker.

Low Pressure Steam in Paper Manufacture

Warren B. Lewis' paper on Uses of Low Pressure Steam in Paper Manufacture was in opposition to the rather widespread movement for the use of high pressure steam in paper mills. He called attention to a general statement which has been the subject of considerable discussion of late, though not exactly in the simple form put by him, which was "Power derived from the act of reducing high pressure steam to low pressure steam costs nothing." He also gave another version of the same idea, as "When all of the exhaust steam ejected by a prime mover is used for process work, the highest degree of efficiency is realized," and then proceeded to point out the errors involved in the application of the statements to industry. As a glaring example of misapplied principle and misdirected effort he instanced a paper by a young engineer analyzing the power and heating requirements of a paper machine in which it was said that an engine which utilized fifty pounds of steam per indicated horsepower would exhaust just enough steam to serve the subsequent purposes of the paper machine. Mr. Lewis said that if a source of mechanical power had been employed which used only twenty-five pounds of steam per indicated horsepower, sufficient power would have been developed not only to drive the paper machine but also another one like it, or some other machinery not utilizing low pressure steam.

Wrong Approach—The trouble, he said, was in the manner of approach. The start is made in the boiler room instead of at the finishing point. No end of papers had been written and read on boiler efficiency, turbine and engine efficiency, modern developments in furnaces and methods of firing coal, whereas the greatest waste came from an improper application of heat and power.

Analyze Processes—The correct method of approach was to study first the minimum requirements for heat. It was easy to dispose of exhaust steam but not so easy to realize the greatest amount of heat from a given quantity of steam. Accordingly, he said, our study should begin with an analysis of every process and every machine which utilizes heat and then make such changes in equipment as would reduce the amount of heat required to a minimum.

The next step would be to conserve the heat which performs no useful work, something which is easier said than done, because it involves the calculation of pipe line sizes for minimum losses and the elimination of unnecessary piping.

Conditions in a Textile Plant—Mr. Lewis has not confined his studies to the paper industry, since besides speaking of a small paper mill with which he is familiar, he mentioned woolen mills and textile plants, with which he is apparently more familiar than with paper mills.

He instanced conditions in a textile finishing plant which used power in much the same way as a paper mill. In this plant there was one cross-compound condensing engine developing 450 indicated horsepower, one simple condensing engine developing 250 indicated horsepower, one simple non-condensing engine developing 250 horsepower, and twenty-six small engines rated from ten to thirty horsepower, all exhausting into processing apparatus. He gave an outline of the various operations and described the heating system.

In closing, Mr. Lewis asked his hearers to forget mechanical power requirements and the boiler plant for the time being

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and study the uses of heat; every operation requiring heat should be done with low pressure steam wherever possible and the amount of low pressure steam should be reduced to a minimum by a proper study of machines in processes. He advised spending money on improving apparatus and piping systems and adopting a type of prime mover which would give the greatest amount of mechanical power per pound of steam rejected.

Mr. Lewis's paper was discussed briefly and there were some dissentients from his views. Waste heat recovery was the topic of the next paper.

Development of Waste Heat Recovery

S. W. Fletcher, of J. O. Ross Engineering Corporation, gave an interesting account of recent developments in the heating and ventilating of paper mills. Speaking of the paper machine room and its correct ventilation, he said that the amount of air to be passed through a machine room depended upon the amount of moisture given off from the paper during its forming and drying stages. The amount of air should be enough to remove the moisture thus evaporated in such a way and at such a rate as would give good working conditions in the room, and no more.

Heating Incoming Air—By removing air from the machine room, a low pressure area is developed which causes an inrush of air from the outside. This air must be heated in its travel from the temperature at which it enters from outside to the temperature at which it is removed from the machine room. The proper method is to heat the air at its point of entry by a central apparatus.

Directing the Air Flow—The next thing is to direct the air flow. In most cases only a portion of this air is needed for preventing condensation on the roof and good results in lowering steam pressure on the dryers and preserving the felts are obtained by supplying air for the bottom return felt. This is done usually by means of ducts across the width of the felt which are equipped with cross nozzle outlets. The cross ducts are fed by a main duct extending lengthwise down the back side of the lower felt. It is this type of installation that has been adopted generally by the big newsprint mills.

Proper Ventilation of Grinder Rooms—Mr. Fletcher then discussed the proper ventilation of grinder rooms. He showed how the Baxter grinder exhaust system was used. The heating problem and the recovery of heat then came in for discussion. With the development of machines capable of turning out a large tonnage per day, the heating of the hundreds of thousands of cubic feet of air required per minute was a factor of pressing importance. This air after being heated passes out through the machine room and absorbs the water which has been converted into vapor by the steam in the dryers. One method of recovering this heat was to use the hot vapor for heating water by passing it through a multiple stage air washer in which the water is finely atomized and passes from stage to stage, while the other method is to use it for heating the incoming air to replace the outgoing air by passing it through a Briner economizer.

The Briner Economizer—The Briner economizer consists of a series of narrow channels separated by a thin piece of metal. The outgoing vapor passes through alternate channels and the incoming air through the other channels. The outgoing vapor which is condensed gives up its latent heat and this heat is transmitted through the dividing sheet and heats the incoming air. In this way an interchange of heat is obtained without mixing the vapor with the fresh dry air. The air apparatus is usually located in a penthouse on the roof. On large machines the apparatus may be built in several units which permits of a flexible and better control installation, at the same time providing that the ventilating system will not be seriously crippled in case one unit is down.

Mr. Fletcher mentioned an interesting development in the setting of Briner economizers that had been tried out in several new mills in Canada and the United States. This consists of placing the air equipment, including the economizers, on a mezzanine floor over the paper machine drives. In this way the exhaust stacks from the hood are brought over horizontally to the economizer. The stacks are kept low enough to permit the crane to pass over them. The supply ducts for the roof are brought in above the crane so that the crane has a clear passage the full length of the machine room.

Use of Excess Heat Recovered—In some cases more heat is recovered from the waste vapor than is needed for the machine room and this has led to an extension of the machine room system to other departments. One mill is heating the beater room and finishing room as well as the machine room with the waste heat in the vapor from the two machines in the room without the use of additional steam.

Improvements in the economizer were noted, such as the use of "booster coils" which take care of periods when the paper machine is not operating. There are installations where the vapor from one machine is sufficient to heat most of the air for a two-machine mill.

Savings Effected—Figures on savings effected by the Briner economizer were not given, but Mr. Fletcher asked his hearers to consider that from 25 to 50 per cent of the steam used for drying paper is used for heating the air for carrying away the moisture given off by the paper and that a large portion of this heating steam may be saved by an economizer utilizing the exhaust vapor. The savings effected here could be figured in dollars and cents, but there are other factors which should not be overlooked. An application of the Briner system was made in grinder rooms in combination with the Baxter grinder room exhaust system which recovered waste heat from the vapor collected from the grinders. The exhaust vapor from the grinder was utilized for heating the grinder room thus reducing the amount of steam required.

It was made evident by Mr. Fletcher that heat recovery in pulp and paper mills had made many advances.

Power Requirements for Pumping Paper Stock

A paper on "Power Requirements for Pumping Paper Stock", by R. Russell K. Annis, was then presented and illustrated by lantern slides. This paper was a continuation of one which had been presented at the annual meeting of the Superintendents' Association in Richmond last year. It described the operation of the Fairbanks, Morse Stock Pump patented by A. B. Wood. The Wood paper stock pump has now been introduced in a number of mills for handling stock at various densities.

There is evidently need for a careful study of pipe friction in order to determine power requirements. The friction of paper stock in a pipe line is not subject to ordinary mathematical calculation and considerable experimentation is necessary to arrive at satisfactory figures.

Mr. Annis's paper attracted considerable attention and was discussed favorably. Its complete text appears in full on another page in this issue.

Inching and Starting a Paper Machine

R. R. Baker's paper, entitled The Starting Generator System Applied to Sectional Paper Machine Drive, dealt with the modern method of starting and stopping the various sections of a paper machine in clearing away "broke," cleaning, repairing and replacing felts and wires, washing up, etc. These operations of inching, starting and stopping must be performed quickly and without overstressing the mechanical parts of the machine, particularly the fourdrinier wire and the drying gears.

The starting generator system of control, as made by the Westinghouse Electric & Manufacturing Company, has been developed to meet exacting requirements in the operation of modern paper machines. With the sectional drive and system of control described by Mr. Baker, each section of the paper machine is provided with a push-button station which includes a "Start" and "Inch" button. To operate a section of the machine the "Inch" button is pressed and when it is desired to start a whole section the "Start" button is pressed. A separate generator is provided for inching and starting and this makes it possible to maintain stable draws on the wet end of the machine even when the dryers or calender sections is being inched.

Symposium on Paper Testing

The Paper Testing Committee met in Room 151 under the

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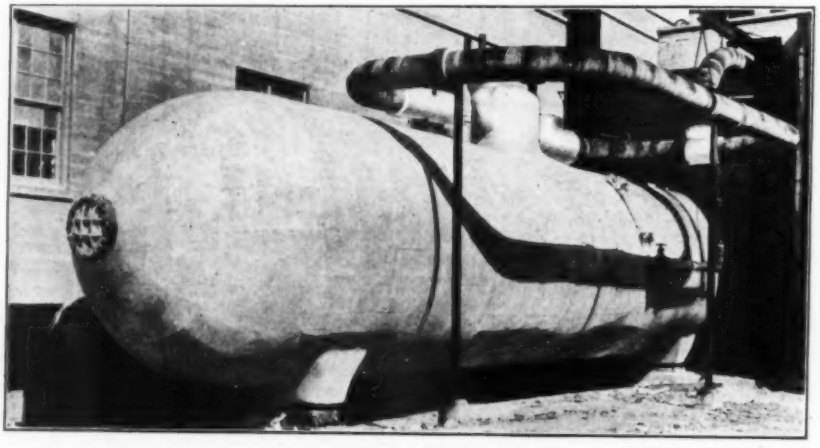

Ruths Accumulator installed at the Manitoba Paper Co., Pine Falls, Manitoba, Canada

In all pulp mills the boilers are called upon to deliver steam in widely varying quantities. All firing equipment has a certain time lag in responding to changes in load. The results of these two fundamental facts are loss of efficiency in the boiler house and delays in the mill itself due to the inability of the boilers and firing equipment to immediately increase or decrease their output.

The Ruths Accumulator stores excess steam during periods of low demand and supplies this steam later on to meet peak loads. The rate of firing is therefore uniform. The boiler efficiency is improved. Moreover, steam is instantly available at constant pressure to meet peak demands. The usual time lag is eliminated—production is increased.

One hundred twenty-six pulp and paper mills have installed Ruths Accumulators. Those in the United States and Canada are listed below.

Algonquin Paper Corp., Ogdensburg, New York.
Bogalusa Paper Co., Inc., Bogalusa, Louisiana.
Brown Corp., La Tuque, Quebec.
Canadian International Paper Co., Gatineau, Quebec.
Canadian International Paper Co., Hawkesbury, Ont.
International Power & Paper Co. of Newfoundland, Ltd., Cornerbrook, Newfoundland.
International Paper Co., Piercefield, New York.
International Paper Co., Niagara Falls, New York.
Manitoba Paper Co., Ltd., Pine Falls, Manitoba.
Price Brothers & Co., Ltd., Riverbend, Quebec.
St. Lawrence Paper Mills, Ltd., Three Rivers, Quebec.

RUTHS ACCUMULATOR COMPANY, INC.
292 MADISON AVENUE, NEW YORK

Canadian Representatives: Combustion Engineering Corp., Ltd., Montreal, Quebec.

chairmanship of B. W. Scribner. On the program were papers as follows: Ink Resistance of Printing Papers, by E. O. Reed; Dot Method, by C. E. Libby; Count of Dirt Particles, by C. R. Tait; Adherence of Mineral Coating, by R. H. Savage; Grease Resistance, by H. A. Smith; Emanueli Porosity Tester, by L. Emanueli, and Expansion of Paper, by R. C. Griffin. Only two of these papers were reprinted, that of Mr. Griffin and the porosity tester paper.

A New Porosimeter

Chairman Scribner mentioned that the porosity of paper, as measured by the rate of passage of air through it was receiving considerable attention. The most common types of instruments for measuring this property make use of a relatively constant driving pressure and measure the rate of flow of air with a timing device. The air is either sucked through the paper by means of partial vacuum or is driven through under hydrostatic pressure. The Emanueli porosity tester is free from some objectionable features peculiar to the instruments ordinarily used.

Influence of Humidity on Properties of Paper

Roger C. Griffin's paper, a contribution from the laboratory of Arthur D. Little, Inc., described an apparatus for testing the behavior of paper under different humidity conditions, which the author terms an Expansiometer.

After a series of tests on papers with the expansiometer the conclusions were drawn that (1) the percentage elongation between 20 and 80 per cent relative humidity is approximately a straight line curve; (2) the elongation is considerably greater in the cross direction than in the machine direction; (3) waxed paper is not appreciably affected below 60 per cent humidity; (4) in most cases the increase in elongation between 80 and 100 per cent humidity is considerably greater than the increase between 60 and 80 per cent humidity.

Cellulose Symposium

The Cellulose Committee met in Room 106 and great interest was taken in its proceedings. An interested observer and participant in the discussions was Prof. Emil Heuser, especially in those relating to the chemistry of lignin.

The first paper presented was on "The Effect of Residual Acid on Rate of Deterioration of Paper", by W. F. Hoffman. This was a contribution from the chemical laboratory of the Northwest Paper Company, Cloquet, Minn. It was set forth that two methods have been suggested for determining the probable resistance of paper to deterioration—the copper number and the acid number. Both determinations require samples of the finished paper. If the deterioration of the paper together with an increase in the copper number is caused principally by an excess of acid in the finished paper then a measure of the acidity of the white water coming from the paper machine should indicate the probable resistence of that paper to deterioration.

It was found that the higher the acid number, and the higher the hydrogen-ion concentration, the greater, in general, was the decrease of the bursting strength of the paper. Control of the hydrogen-ion concentration of paper stock during manufacture was indicated.

The permanence of paper was discussed in the next contribution to the discussion.

Permanence of Paper

Dr. Theobald C. Bentzen does not believe that a writing paper can be made with the addition of sulphite pulp and have permanent qualities equal to an all-rag paper. He quoted H. P. Stevens, author of **The Paper Mill Chemist**, and S. Kohler and Gösta Hall in support of his contention. The higher the proportion of high-grade rags that goes to the manufacture of a paper stock, the more permanent the paper will be. Of all questions and problems concerning writing paper, that of permanence was of the most important, he said.

A lengthy discussion followed the presentation by W. E. B. Baker, chairman, of some observations on the chemistry of lignin, without however advancing our knowledge of the subject appreciably, though Professor Heuser played a prominent part in debating some of the views put forward.

SECTIONAL MEETINGS ON THURSDAY

Three sectional meetings were carried on simultaneously on Thursday morning in the Myrtle Room, and in rooms 106 and 110 of the Waldorf-Astoria. George K. Spence had charge of the discussions on Stuff Preparation, in the Myrtle Room, while the groundwood men were holding forth under S. C. Brayton in Room 106. Allen Abrams, chairman of the committee on Training for the Industry conducted a discussion of the training program in Room 110, after H. G. Noyes had presented his paper entitled "Technically Trained Men for the Paper Industry."

Following a short explanatory talk by Chairman Spence on the scope of the Stuff Preparation Committee, G. H. Chidester, of the Forest Products Laboratory, Madison, Wis., presented a paper describing the operation of and results with the Allis-Chalmers Rod Mill. The paper was incomplete and will not be released for publication for a month.

The chair then called for the paper on "Some Tests on a Jordan Using Kraft Pulp."

Efficiency of Jordans

J. S. Little's paper gave the result of tests on the treatment of kraft stock with a Noble & Wood baby jordan with a view of determining effect of consistency on the physical properties of the treated pulp and to what extent these could be altered by one passage through the jordan. Lap stock containing about 65 per cent moisture was used. The treated pulp was tested for slowness, shrinkage, and bursting, tearing and tensile strengths.

New Slowness Test—The slowness of the pulp was determined by a different procedure than that usually followed. The apparatus consisted of a vertical brass tube 4 ft. long and 1½ inches in diameter to the bottom of which a ⅜-inch U pipe was fastened in such a way that a piece of fourdrinier wire was interposed between the two tubes. The U pipe is filled with water until the level of the water reaches to the bottom of the screen and it is stoppered before filling the larger tube with the stock. A glass gauge connected to about three inches from the top of the U pipe will show the level of the stock in the upper tube. This tube is filled with 0.085 per cent stock at 25° C. and the stopper at once pulled from the Y tube, the time required for the stock level to drop 2 ft. from the top of the upper tube being determined by a stop watch. This time expressed in seconds is recorded as the "slowness" of the pulp.

Shrinkage Test—Six test sheets for each pulp test are made with a Williams sheet machine, 4.5 gram sheets measuring 7.5x7.5 inches. After being pressed at 200-lb. per square inch for one minute the sheets are removed from the felts, marked in two directions for the shrinkage test and dried for two hours at 103° C. The distance between the marks is then measured for shrinkage.

Experiments with the Baby Jordan—Details were given of the various tests. An Elmendorf was used for the tearing strength and a Mullen for bursting. The tensile strength was taken with a Scott instrument. In determining the effect of consistency, a certain setting of the jordan was arranged so that the rate of flow could be accelerated or diminished. Changes in consistency did not affect the treatment of the pulp by the jordan. By moving in the jordan plug, changes were effected in the physical properties of the pulp, there being an increase in bursting and tensile strengths and decrease in tearing strength. There is more energy expended in hydrating a stock in the beater than when the jordan is used. Thus the figures in the curves which accompanied the paper showed that the jordan uses only about 35 per cent of the energy that a beater does in bringing pulp to a slowness of 23 seconds.

That increasing interest is being taken in the control of acidity and alkalinity in paper manufacturing operation was demonstrated by the interest taken in the succeeding discussion.

Measuring Acidity and Alkalinity in the Paper Mill

W. F. Hoffman's paper on Hydrogen Ion Measurements in the Pulp and Paper Mill was concerned chiefly with the electrometric method of determining hydrogen-ion concentrations. Mr. Hoffman is chemist at the Northwest Paper Company,

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A Paper Bag gets just about the roughest treatment known. It's twisted; it's crumpled; cans, boxes, bottles or vegetables are carelessly thrown in.

For many years Union TIGER KRAFT has been the standard of value for Grocery Bags.

In MONOGRAM KRAFT, Union offers the identical Tiger Kraft bag paper in rolls and sheets—the same finish and the same specifications.

No ordinary tests can indicate MONOGRAM KRAFT quality, because it has been built to meet the same drastic treatment as *bags* receive.

A tumbling-drum—the severest test a container can get—is used to determine the specifications of Union Bags. From the results of drum tests, standards of Mullen, tensile strength, folding-endurance and other specifications are obtained. These standards are also used for MONOGRAM KRAFT.

The best paper cannot be built to any single instrument test. It must be built, as is Union MONOGRAM KRAFT, to a balance of characteristics that will resist rough usage.

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Cloquet, Minn., and is familiar with the various substances in pulp and paper mills the hydrogen ion concentration of which it would be valuable in the interest of economy and uniformity of production to know. W. A. Taylor has described, in papers read before the Technical Association of the Pulp and Paper Industry and contributed to THE PAPER INDUSTRY, the colorimetric method of measuring the hydrogen-ion concentration of liquids, but this is a simple and easily applied method compared with the electrometric method. Mr. Hoffman stated, however, that by reason of modern developments, an apparatus for routine hydrogen-ion measurement could now be purchased from chemical supply firms that was capable of being used satisfactorily even by non-technical men. It is quite true that once the technique is mastered, the operation of a hydrogen-ion determination by the electrometric method becomes a routine procedure, and the apparatus is nowadays usually to be found in the chemical laboratory of any large mill.

Meaning of Active and Total Acidity—Mr. Hoffman gave a simple explanation of the difference between "active" and "total" acidity, using acetic acid and hydrochloric acid as examples. Active acidity cannot be measured by titration, and to determine it the hydro-ion concentration must be measured. His explanation necessitated references to equations and logerithms, but even these were fairly easy of comprehension though lengthy and detailed.

The function of "buffer" solutions, used to prevent sudden changes in the hydrogen-ion concentration when strong acids or strong bases are added to a system, was explained. This part of the paper constituted a little lecture by itself on the importance of knowing the hydrogen-ion concentration of the liquors and systems in a pulp and paper mill. Two solutions may be of equal strength when tested for total acidity, but one may have a pH of 2 and the other a pH of 7, or two solutions may have the same pH but one may have ten times as great titratable acidity as the other. These were cited as extreme cases.

Bibliography of the Subject—The bibliography cited by Mr. Hoffman should be serviceable to all who are taking up the study of hydrogen-ion determination either by the colorimetric or the electrometric method. In addition to the references to W. A. Taylor's article in **Industrial and Engineering Chemistry**, 19 pp. 999—1004 (1927), and **Technical Association Papers**, Series ix, No. 1, 38—43 (1926) and papers by Shaw, Oman, and Buch, as well as a forthcoming article by K. W. Franke, in **Industrial and Engineering Chemistry**, he quoted the following book titles: **Determination of Hydrogen Ions**, by T. Mansfield Clark (Williams & Wilkins Co., Baltimore, 1923); **Potentiometric Titrations**, by I. N. Kolthoff and Howell N. Furman (John Wiley & Sons, Inc., New York, 1926), and **Hydrogen Ion Concentration**, by L. Michaelis (Williams & Wilkins Co., Baltimore, 1926).

Applications in Mill Work—Among the applications of hydrogen-ion concentration determinations in pulp and paper mills, mention was made of the water supply. The pH of untreated water varies from season to season, and it is important to maintain it at a certain figure.

In the sulphite mill the hydrogen-ion concentration of the cooking liquor should play an important part, while the pH of the wash water has an effect on the efficiency of washing woodpulp. It is probable, as Mr. Hoffman says, that the resins are more easily removed at certain hydrogen-ion concentrations than at others.

In the sulphite mill the hydrogen-ion concentration of the as cooking liquors are so strong that the hydrogen-ion concentration determinations would be practically worthless, though the black liquor might be studied in this way.

Bleaching liquors should be studied to determine their optimum pH, followed by a study of the pH best suited for washing the bleached pulp.

In paper manufacture, the contents of the beaters should be examined for their pH content. Adsorption of clay, alum, size and dye by the fibers is a colloidal phenomenon which is markedly influenced by changes in hydrogen-ion concentration. "The characteristics of the adsorbed aluminum hydroxide may markedly influence the adsorption of dye and rosin." Aluminum hydroxide will form and precipitate best only within certain limits of hydrogen-ion concentrations.

The Bailey hydrogen electrode and the antimony electrode were recommended by the author for use in pulp and paper mill laboratories.

In reply to questions Mr. Hoffman mentioned different types of electrodes and gave the information that Leeds & Northrup Company, Philadelphia, were the only manufacturers of recording potentiometers.

Exceptions by Dr. Taylor

Some of the statements made by Mr. Hoffman in his printed paper were questioned by Dr. W. A. Taylor of the LaMotte Chemical Products Company, who was quoted in it on the colorimetric method of measurement. His communication on the subject was read by Secretary Macdonald.

Doctor Taylor said that when buffer action was illustrated by an ordinary chemical equation as in Mr. Hoffman's paper,

Picture taken at the annual TAPPI banquet, February 22, 1928, Hotel Commodore, New York City

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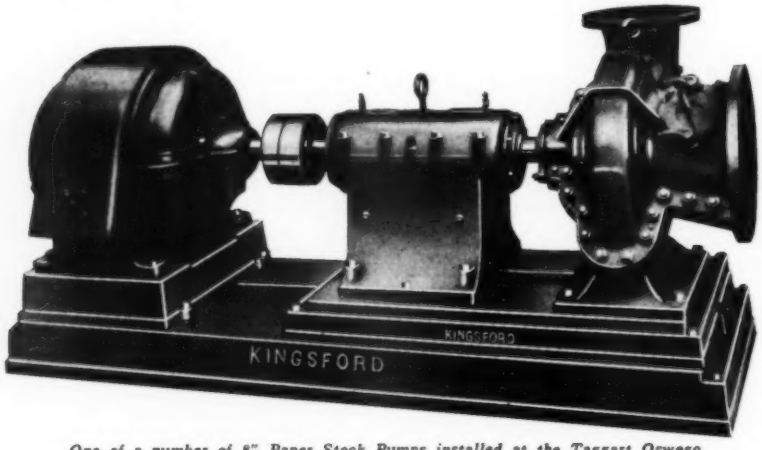

One of a number of 8" Paper Stock Pumps installed at the Taggart Oswego Paper & Bag Corp., Oswego, N. Y.

Pump is all cast iron extra heavy construction, split horizontally at an angle of 45 degrees so that the interior of the pump can be dismantled without distributing the suction or discharge pipe.

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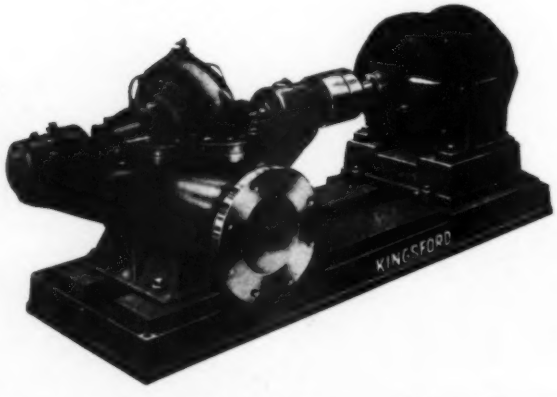

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there was a danger that it might be confounded with straight neutralization. He gave an interesting explanation of the function of buffers. The chemical compounds designated as buffers act by suppressing the ionization of an acid or base and thus tend to reduce the hydrogen or hydroxyl ion concentration. He instanced acetic acid and its salt, sodium acetate. Acetic acid dissociates to yield

$$HA \rightleftharpoons H^+ + Ac^-$$

but only to the extent of about 1.36 per cent at 18°C. Sodium acetate on the other hand is highly dissociated to yield

$$NaAc \rightleftharpoons Na^+ + Ac^-$$

and the high cencentration of acetate ions tends to tie up hydrogen ions as undissociated acetic acid and thus lowers their concentration, which results in an increase of pH.

Doctor Taylor also questioned Mr. Hoffman's intimation that salts of strong acids and strong bases have no buffering power. A one-hundreth normal solution of sulphuric acid will have a pH of 1.8, but the presence of 10 per cent of glauber salt increases this to 2.6, showing a lowering of the active acidity, despite the fact that the total acidity has remained unchanged.

First Thousand the Hardest

Doctor Taylor said he had never been able to secure accurate results at the rate of 20 to 25 determinations per hour, which led Mr. Hoffman to come back with the statement that if he had made as many hydrogen-ion determinations as Hoffman had, he would learn that the first 1,000 was the hardest, but that after that they would come easier at 25 to the hour.

A point made for the colorimetric method by Doctor Taylor was that it combined extreme simplicity and rapidity with an accuracy sufficient for all practical purposes.

The concluding paper of the sitting related to means of eliminating foaming on a paper machine and was read by the chairman.

Control of Foaming on the Paper Machine

George K. Spence gave in his paper on Control of Beater Furnish in Order to Eliminate Foaming on the Paper Machines some of the sources of foam and methods of overcoming it. He named six causes of foaming as follows: alkalinity of stock; colloidal stock; glue and other foam producing substances in old paper stock; raw size; leaky circulating pump; faulty head box construction.

Remedial Measures—To overcome alkalinity, he advocated a slight souring of the pulp to dissolve any calcium carbonate present from bleach residues. Old paper stock may retain sodium carbonate from insufficient washing of the deinked stock. Alkalinity in soda, sulphite, and old paper stocks should be corrected before these are delivered to the beater, and maintaining a pH of 5.5 in the beater before adding size and alum.

Colloidal stock results from the formation of oxycellulose in the process of bleaching soda and sulphite pulp; proper washing will remove it. Colloidal stock gives rise to excessive foam when it is stirred up; calcium chloride is a measure of colloidal stock, the latter being present in direct proportion to the calcium chloride contained.

Old paper stock requires to be washed thoroughly to remove glue and other colloidal material used in sizing and coating.

Meaning of "Raw Size"—An interesting observation was made on the formation of raw size through failure to control the alkalinity of the beater furnish; if the alkalinity is high, the alum will be exhausted in neutralizing it and there will be none left to precipitate the rosin so that raw size may pass to the paper machine in the stock furnished and cause trouble from foaming.

Foaming Due to Air—Air may be sucked in through a leaky circulating pump and when it works out of the stock again it will have a tendency to cause foam. The pump should be examined from time to time and kept well packed to avoid such leaks.

When excess stock from the head box returns to the circulating tank it usually drops down through a pipe, forming a funnel of stock which sucks a large volume of air down with it to be mixed with the stock. As a remedy, Mr. Spence said the head box should be so arranged that the opening in the inlet tube would be sealed at all times to prevent air entering with the stock on its return to the circulating tank or passage to the flow box.

The paper was discussed by Dr. John S. Bates, of Price Bros. & Co. Ltd., who sought to obtain from the chairman some definite explanation of the causes of foaming and means of prevention, but the replies were not enlightening as to either, and Doctor Bates dropped the subject.

Groundwood Developments

A meeting with the Mechanical Pulp Committee in Room 106 brought out some interesting facts concerning progress in waste reduction and in the improvement of grinding apparatus.

S. C. Brayton, of the Itasca Paper Company, Grand Rapids, Minn., read his report as chairman and mentioned that a device for checking the amount of slivers produced by an individual grinder, which is used as a complement to the standard freeness test, had been developed in the mills of the Kimberly-Clark Company would soon be available to the industry through a midwestern manufacturer of machinery. The committee had studied the use of refiners for reclaiming groundwood screening waste. It developed that mills reclaiming screenings were not refining them into newsprint stock. It would appear that rejections go into the manufacture of board or of mill paper, so called bogus wrappers, though some mills cook rejections in kraft and sulphite mills.

Development of Magazine Grinders

A. E. Parrett, of the St. Anne Paper Company, Beaupre, P. Q., gave a most informing and interesting account of the development of magazine grinders, of which, he stated, the first was the Waterous, or hydraulic grinder, with intermittent feed. This was followed by the Warren type, equipped with chains instead of hydraulic cylinders and affording continuous feed. The Voith grinder originated in Germany about the same time. It was followed by the continuous type, one embracing the best points of design of the others mentioned. One mill is operating a grinder having both feed chains and pressure feet.

Larger Pulpstones May Be Used—The extent to which the width of the magazine or the size of the grinder will be carried was the subject of speculation by Mr. Parrett. With the advent of the artificial stone, it is possible to make stones larger than 54 by 67 inches and put them in grinders having pockets larger than 53 inches. Grinders might be constructed of 50 tons capacity, but other means of mechanical pulp production may be utilized in the future.

A Comparison of Grinders and Paper Machines—A study was made of the number and types of grinders as compared with paper machines (newsprint), and the widths of paper trimmed in various mills, as follows:

Wayagamack Pulp & Paper Company—eight Warren grinders; two 162-in. machines.

Backus-Brooks, Ltd.—six Warren grinders one 245-in. machine.

Abitibi Power & Paper Company—fifty-one 3-pocket grinders.

Brompton Pulp & Paper Company—twenty-four 3-pocket grinders; one 234-in. machine.

St. Lawrence Paper Mills, Ltd.—sixteen Waterous magazine grinders; four 158-in. machines.

Newfoundland Pulp & Paper Company—twenty-two continuous grinders; four 234-in. machines.

Canadian International Paper Company, Gatineau—twenty-four continuous grinders; four 270-in. machines.

St. Anne Paper Company—ten continuous grinders; two 234-in. machines.

Manitoba Pulp & Paper Company—ten continuous grinders; two 234-in. machines.

Spruce Falls Power & Paper Company (to be erected)—sixteen continuous grinders.

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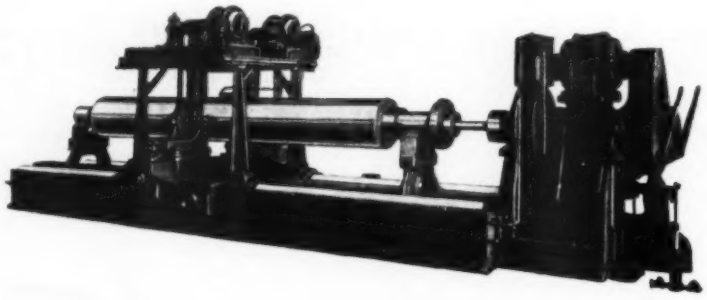

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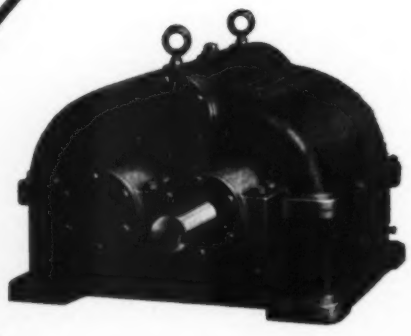

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Price Bros. & Co., Riverbend—twelve Voith grinders; two 234-in. machines.

Mills having more than one type of grinder were noted, as follows:

Canadian International Paper Company, Three Rivers—fourteen Waterous, fourteen Warren, two 4-pocket; eight 160-in. machines.

Port Alfred Pulp & Paper Corporation—twelve Warren, ten continuous; four 212-in. machines.

Price Bros. & Co., Kenogami—fourteen Voith, forty-seven 3-pocket; two 234-in. machines, five 156-in. machines.

Belgo-Canadian—eighteen Waterous, twenty-six 3-pocket; two 234-in. machines; two 230-in.; one 202-in.; one 152-in., and one 127-in.

Characteristics of Grinders—The characteristics of the different grinders were described in Mr. Parrett's paper. The capacity of the new Waterous or magazine grinders in the Anglo-Canadian mill, Quebec, and Lake St. John mill, Misstassini, has been increased from 18 tons to 21 to 24 tons. It was noted that the latest newsprint machines are designed to run at 1,200 and 1,400 ft. a minute and are equipped with suction couch, suction first and suction second presses. He expressed the opinion that grinder construction of the future will provide for very large artificial stones. It was futile to assert that one particular type of grinder was superior to any other. Each grinder has its advantages and operates successfully under different conditions. He closed his paper with the significant observation that "Our forests do not warrant further pulp and paper mill expansion and present day manufacturers will be somewhat loath to scrap and change present successful types unless there are very great economic possibilities."

Ball-Bearing Artificial Pulpstones

W. E. Brawn, of the Pejepscot Paper Company, reviewed progress in the development of special equipment for groundwood mills, noting the use of artificial grindstones, anti-friction bearings and vacuum thickeners. The application of ball bearings to grinding equipment has been taken up in a practical way by SKF Industries. Progress was reported in the improvement and redesigning of standard equipment; thus the makers of vacuum filters have demonstrated that these machines can be used as combined thickeners and stock savers.

Artificial grindstones constructed of natural quartz is a development which is in the experimental stage. Artificial stones of carborundum have been in use for some time and can be duplicated exactly so that uniformity in grinding conditions can be maintained.

Performance of an Artificial Stone—Mr. Brawn described an experience with the use of artificial stones which he considered more or less representative of that of other companies in the early use of artificial stones. The stone reported on was put in operation February 3, 1927, and taken off September 16, 1927, grinding an average of 5.55 cords per grinder day, 1,046.25 cords of wood being reduced to pulp in 188.2 grinder days. The stone measured 27 inches wide by 54 inches in diameter at the start and during its operation 1,139 cubic inches were worn off, representing about 1 inch of stone per ton of pulp, figuring 1.1 ton of pulp to the cord of wood. The cost of the stone was 10 cents a cubic inch which made the stone cost equivalent to 10 cents a ton.

The stone was built on a waterwheel-driven line having two stones, the waterwheel rating for the two grinders being 850 h. p. The speed of the grinder was 189 r. p. m. and the average pressure 96 lb. in a 10 inch cylinder. The average freeness as recorded by an A. B. Green freeness tester was 178. The average grinding temperature was 144° F. and the grinding consistency 4.90 on a bone-dry basis. During the life of the stone extending over 188 days it was sharpened thirty-seven times with a spiral burr, ten cuts to the inch and a three-inch lead. Different burrs were experimented with, but it was found that it did not make much difference which burr was used, as it is the grit in the stone which does the cutting.

Waste from Coarse Ground Stock—On account of the freeness of the stock there was considerable waste caused by coarse ground pulp, so a two-plate flat screen, equipped with fourteen cut plates was set up and tests made for screenings. It was found that rejections from stock ground on the artificial stone did not differ from those with a freshly sharpened standstone. The stock was naturally free, and the fiber long, with almost a complete absence of sawdust and stubby shives. On replacement a stone of a slightly finer grit was obtained. The stone reported on was the manufacturer's No. 30 grit stone. This gave a pulp that was rather free and the new stone would be 36 grit.

With the artificial stone there was increased production and more uniform pulp. There was a saving in burr cost because the stones required less frequent sharpening.

Ball Bearing Grinders—Mention was made of a grinder at the mill of the Itasca Paper Company which had been equipped with anti-friction bearings. A comparison of results with and without anti-friction bearings, showed average freeness 75, production 212.4 tons, power consumption 202, 420 kw. h. or an average of 933 kw. h. per ton, over a period of sixteen days. This represented the performance of the stone as operated with anti-friction bearings, indicating a saving in power of 6.1 per cent as compared with the performance of a natural stone running on plain bearings. The average freeness with a natural sandstone over a period of thirteen days was 76, and the production for the same period 171½ tons, with a power consumption of 174,060 kw. h., or an average of 1,015 kw. h.

Vacuum Thickener and Saveall—At the Itasca Paper Company a vacuum-type groundwood decker takes the place of a groundwood decker and white water saveall, combining the two operations, according to an arrangement described as follows:

All of the excess white water from the paper machine department is piped back to the groundwood mill and the white water in the groundwood system is so arranged that if there is an overflow it will come from the vacuum type decker. The use of fresh water showers on the paper machines caused an excess of about 300 g. p. m. white water. When the standard type deckers were used, the stock in the white water was found to be about 7½ pounds air-dry per thousand gallons, making a total daily loss of about 3,240 pounds a day. With the vacuum-type decker, the density of the white water going to waste was reduced to about 1½ pounds air-dry per thousand gallons, which gave a total daily waste of 719 pounds air-dry, a daily saving of 2,521 pounds. This, if valued at $30 per ton, for a 300-day year would amount to $11,344 saving per year. At the same time, this decker is deckering about 30 to 35 tons air-dry stock a day and consuming less than 4 h. p. for operation.

Freeness Test for Groundwood

The need for a standard freeness tester with a standard procedure was pointed out by R. J. Schadt in a paper by him entitled Technical Control in the Groundwood Mill. Freeness tests on groundwood are done regularly in all mill laboratories where groundwood is made, but there is no co-ordination of methods and what means one thing in one laboratory may mean something else in another, even where the same tester is used. The consistencies and volumes used in making the tests give results that are difficult of interpretation by chemists using different consistencies and volumes. Mr. Schadt suggested the development of a standard freeness tester or the general adoption of one already on the market and the working out of a method of procedure by the Forest Products Laboratory.

Blue Glass Best for Grindstone Tests—As a method of checking the performance of grindstones, the freeness test gives questionable results, and inspection through blue glass seems to be considered a more dependable procedure. The consistency of stock going to the screen is often a measure of value in controlling the degree of screening and the test is usually made simultaneously with a freeness test.

As a check on stones with regard to production, quality and power consumption the horsepower used per cord is used by some mills as a control test, but, as is obvious, this can only be used by mills that have individual drives; here it gives satisfactory results when regularly applied every two hours.

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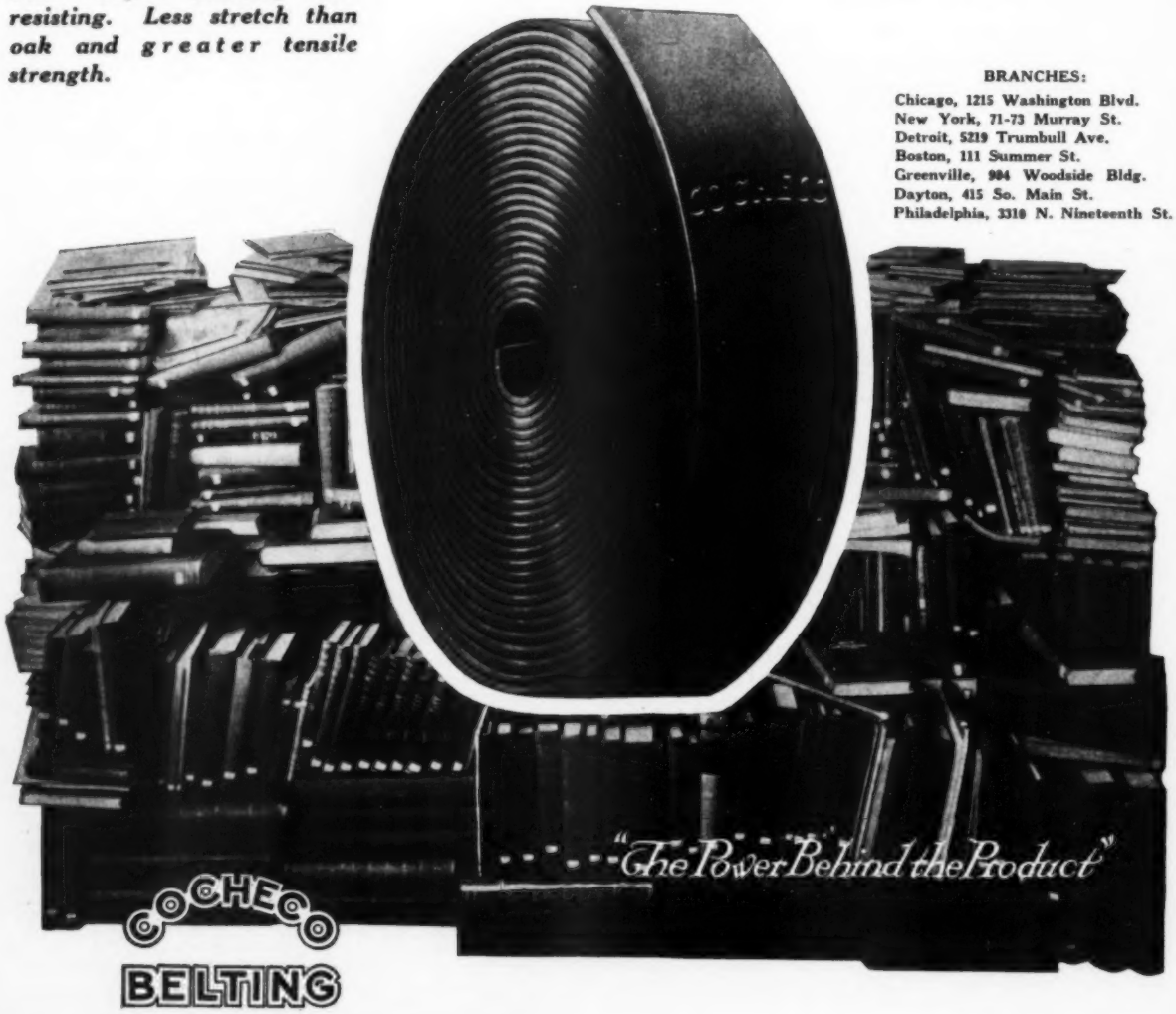

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Measuring Groundwood Tailings—Mr Schadt reviewed the measurement of groundwood tailings which is done by collecting the material on wet machines. Periodic inspections of this kind furnish a check up on losses. The wear on stones is determined in some mills in terms of cubic inches of stone worn per cord of wood ground.

Training for the Industry

The subject of developing sources of supply of technical men for pulp and paper work and the best means of establishing contacts between the industry and schools and colleges occupied the committee on Training for the Industry in Room 110 under the chairmanship of Allen Abrams. There was a general discussion of the training program.

Co-operation Between Schools and Industry

H. G. Noyes, who is connected with the Appleton Vocational School, Appleton, Wis., discussed in his paper on Technically Trained Men for the Paper Industry the source of future technical men. Engineering colleges and technical schools should be looked to provide applicants for positions in the mill, and schools and mills should get together for the working out of satisfactory plans of operation. The Committee on Training for the Industry of T. A. P. P. I. has advocated that representatives of pulp and paper mills visit the engineering schools contiguous to paper making centers and make addresses to classes. There could be presented to the students an occupational analysis of the industry, pointing out its requirements and the possibilities open to young men who decide to enter it. This plan has worked out well in Wisconsin and should apply anywhere when the potential cooperating agencies get together and boost the plan along. Opportunities should be given to engineering students to get contact with mill work during their vacation period.

Concluding General Session

At the closing session of the Technical Association, held in the Myrtle Room of the Waldorf-Astoria on Thursday afternoon, the report of the Nominating Committee was received and acted upon, all of the former officers being reelected, except R. S. Kellogg, whose term on the executive committee had expired. He was succeeded by W. G. MacNaughton. The complete list of officers is as follows:

President—E. C. Tucker, Holyoke, Mass.

Vice President—P. H. Glatfelter, Spring Grove, Pa.

Secretary-Treasurer—Ronald G. Macdonald, New York.

Executive Committee—E. C. Tucker, P. H. Glatfelter, Allen Abrams, W. G. MacNaughton, H. O. Keay, R. H. Laftman, B. T. McBain, M. A. Krimmel, E. R. Low.

The regular business of the session was then taken up and Clarence M. Baker, engineer of the American Paper and Pulp Association, was invited to present his study of "Technical Problems in Waste Utilization and Stream Improvement."

Technical Problems in Waste Utilization

C. M. Baker discussed in his paper the technical problems in a study of the effect of wastes on water courses and the sanitary analyses of the wastes and water of the stream. The public has an erroneous notion that all wastes from industries have a lethal effect on fish and other aquatic life, but Mr. Baker pointed out that this is seldom the case. Chlorine from the bleaching department might be toxic, but this is never passed in sufficient concentration to cause the death of fish though it might improve the stream from the public health standpoint by killing disease germs in it. Factors in stream pollution were referred to as suspended solids from domestic sewage and packing plant wastes as well as other suspended materials that may settle as a sediment. There was no scientific support for the contention sometimes made that fiber wastes lodge in the gills of fishes and interfere with their breathing process.

Oxidation of Nitrogenous Matter—He described the process by which nitrogenous organic matter in a stream is decomposed or broken up. The dissolved oxygen in the water of the stream effects their oxidation, and it is therefore important to avoid throwing anything into the stream that might be capable of exhausting the oxygen.

He described the methods of making sanitary analyses which are described in detail in "Standard Methods of Water Analysis," of the American Public Health Association. The determination of dissolved oxygen and the requirements of wastes upon the oxygen resources of the stream were important in measuring the comparative effect of various wastes upon a stream.

Deforestation Deleterious to Streams—The characteristics of streams with regard to their ability to assimilate pollution were described. The character of aquatic life in streams has been changed by deforestation more than all the pollution they have been subjected to. In forest areas, a stream was cooled and springfed, shaded by trees. With the denudation of forests, the shade has been removed, the springs have dried up or changed to a turbulent muddy stream at high water and a tepid slow flowing stream during the summer. Trout will not live in such a stream, though originally they have been abundant in it.

Serious Factors in Stream Pollution—The character and effect of polluting substances and a comparison of paper mill wastes as compared with domestic sewage constitute a valuable and suggestive part of the report, which was illustrated with charts and graphs. The author's conclusions are that many pulp and paper mill wastes are serious factors in stream pollution, the most objectionable one being sulphite waste liquor. An analysis of the various classes of wastes should be made at mill sources, either individually by the mill chemists or in co-operation with State officials. These were necessary, he said, in order to evaluate or determine the efficiency of any means that might be taken to improve the situation.

In the discussion that ensued, mention was made of a new process for evaporating waste sulphite liquor that had been introduced by E. B. Badger & Sons Company, Boston, and Miss McGrath, of the Booth Chemical Company, told of savings effected in the strawboard industry by the use of Boothal. Stream pollution had also been prevented. A saving of $4 to $5 a ton by recovery of fibers was reported.

H. J. Skinner, of Skinner, Sherman & Esselsen, Boston, mentioned some recovery work that had been conducted in Massachusetts on the north bank of the Nashua river, where nine or ten mills were deinking and defibering papermaking material.

After W. D. Sommerville had presented his paper on "Radio Control of Moisture in Paper Drying", there was a discussion of machinery used in the coating and embossing of papers.

Paper Converting

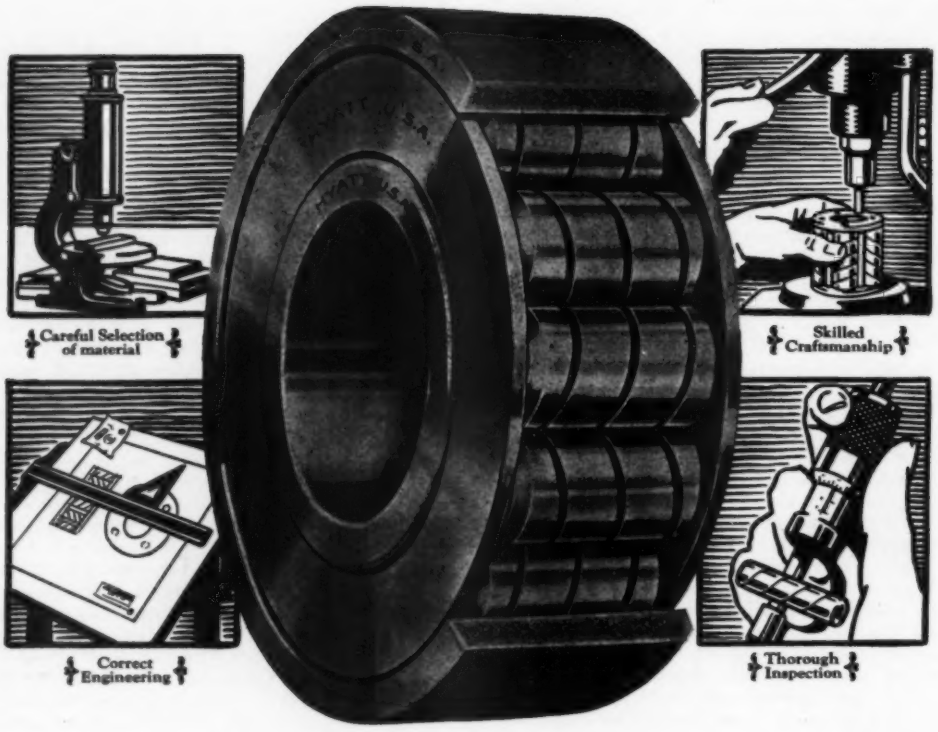
In his paper, entitled Converting of Light Weight Papers, L. B. Case, of the John Waldron Corporation, said there were three general classifications included in the term "converting" —namely, coating, printing and embossing and what was meant by these terms and the operations involved were explained. Coated papers are made on brush machines, though the knife and spray methods are also used. An increased demand was reported for varnished and lacquer surfaces. He mentioned the methods of drying coated paper; 95 per cent of the drying is done on festooning machines, especially where light-weight papers are concerned.

Under printing, he described plate printing, surface printing and intaglio printing. Technical details of the printing presses and machines used in printing and embossing were given.

The T. A. P. P. I. Banquet

The annual dinner of the Technical Association of the Pulp and Paper Industry, which was held on Wednesday evening, February 22, at the Hotel Commodore was characterized by several novelties in the way of entertainment, some of which were not so fully appreciated as they might have been if better understood by the diners. Angus McMillan Fraser, pipe major of the Lovat Pipe Band, was there in full High-

This concluded the proceedings and the thirteenth annual meeting of the Technical Association stood adjourned.



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land attire, kilts, sporran and an' a'. He played bagpipe selections with a gusto that made the windows rattle and threatened the eardrums of those who were unaccustomed to the skirlin' o' the pipes. He played a number of favorite Scottish airs including "79th's Farewell to Gibraltar," "Barren Rocks o' Aden," "Dornoch Links," "Bonnie Dundee," "Bannocks o' Barley Meal," and "Glendarual Highlanders." Between whiles, two young girls danced the Highland Fling, one of them giving a fine exhibition of the Highland Sword Dance, as well as a Sailor's Horn Pipe and Irish Jig, which mitigated to some extent the agonies of the bag pipes.

Chemical Inventions—Following the enjoyment of an excellent meal, President E. C. Tucker, who acted as toastmaster, introduced Dr. Edward R. Weidlein, director of the Mellon Institute, who was down on the program for an address on "Organized Industrial Research," but changed his subject, or rather the subject matter of his speech, because, as he said, he considered it might be too serious for the occasion. Whether the general mirth and noise accompanying the Hielan' foray had anything to do with this departure from the program was not made clear.

Unexpected Results—Doctor Weidleins account of the chemical researches and developments to the credit of the Mellon Institute engaged the fascinated attention of his audience. He told of research work begun with a certain definite end in view which had turned out quite differently and yielded altogether new products, as for instance when after working for many years to make an artificial substitute for surgical sutures they got a substance that turned out to be one of the best tennis strings ever made and which is now in great demand. Work on a new varnish compound resulted in the production of an artificial resin, and some experiments with cellulose solutions yielded an artificial sausage casing.

New Glycerin Substitute—He then touched on some of the applications of scientific methods to industry. One great achievement to the credit of the Mellon Institute, which he mentioned, was the production on a commercial scale of a substitute for glycerin, ethylene glycoll, which is now being produced and used at the rate of something like 20,000,000 pounds a year. Although it replaces glycerin in many applications, there has been no diminution in the demand for glycerin and the market has not been disturbed. A new volatile solvent for resins and oils had been developed which made it possible to repaint a room or an automobile in much less time than it took formerly. Thus a room painted during the day could be occupied at night, the drying and setting of the paint being extraordinarily rapid with the new solvent.

National Self Protection—Every country was developing self protection in which the chemical industry was playing a big part. The fertilizer industry would seem to be an innocent business and so does the manufacturer of pharmaceutical products, but each requires little change to convert them into plants for the manufacture of explosives. German chemists are now making petroleum artificially and will soon be independent of coal. By the operations of cartels or trusts they can throw all their surplus materials on the American market and make a profit.

Increased Education Means Increased Wealth—The next speaker was Dr. Hollis Godfrey, president of the Engineering-Economics Foundation, Boston. By means of graphs and charts he showed three great trends in the growth of wealth and education in the United States from 1906 to 1927. Since 1907 wealth has increased 414 per cent. The number of regular students in secondary schools has increased 410 per cent. The curve of growth in educational development was shown to match point by point and line by line with the growth of wealth. As education moves by wealth so does the tool of education—the book, and there was no point where the gain in the number of books in a great library had not preceded the gain of wealth.

Knowledge is Solvency—Dr. Godfrey's thesis was that knowledge and education invariably preceded wealth. Education was the cause of wealth, and wealth provided the potential capacities for education.

The Engineering-Economics Foundation undertook to ascertain if men have failed or have succeeded in business as they gained in knowledge. They took all the failures and successes from 1881 to 1927 and then calculated the percentages of failures from 1881 to 1900 which was a period of many failures; throughout this period the percentages of failures were high. But the line of knowledge was rising slowly and in 1900 jumped upwards rapidly. From that time the percentage of failures has remained low, for knowledge is solvency; knowledge is gain in wealth.

The Case System on Wealth—In summarizing the result of the researches conducted by the Engineering-Economics Foundation, he gave credit to the case system developed at Harvard University for teaching men and women how to use the great resources of manpower, of physical energy, of chemical materials and of finance, in order to create wealth. The meaning of it all was not quite clear to a majority of the audience, but Dr. Godfrey said the lesson was that the next generation would take one fourth of the directing places in industry. "For all of those around you who are coming up in succession and which is always passing on in industry, and for your children who are coming from the home and entering, there is today a measured, usable, practical method of a case system on wealth." It was important, he said, to teach men to use the tools which are in front of them which they must use day by day to gain that social and that economic advance, as on that largely depended their own future.—And thus ended the lesson, and the banqueters dispersed, without benefit of bagpiper to play them out.

President's Annual Luncheon

One of the interesting and enjoyable features of the social program at the annual convention of the American Paper and Pulp Association in New York was the luncheon given in honor of D. Clark Everest, president of the Association, which was given between the forenoon and afternoon sessions of the general meeting of the A. P. and P. A. on Tuesday, February 21. It was an invitation event and was attended by a group of notables in the paper industry. Those present were:

Officers and Members of Executive Committee

D. C. Everest, Marathon Paper Mills Co., Rothschild, Wis., President.
S. L. Willson, American Writing Paper Co., Holyoke, Mass., Vice President.
Felix Pagenstecher, Bryant Paper Co., Kalamazoo, Mich., Vice-President.
J. P. Hummel, Hummel-Ross Fibre Corp., Hopewell, Va.
Milton E. Marcuse, Bedford Pulp and Paper Co., Richmond, Va.
Norman W. Wilson, Hammermill Paper Co., Erie, Pa.
W. L. Carter, Nashua Gummed and Coated Paper Co., Nashua, N. H.

Past Presidents of the Association

A. C. Hastings, West Harwich, Mass.
Walter J. Raybold, B. D. Rising Paper Co., Housatonic, Mass.
George W. Sisson, Jr., Racquette River Paper Co., Potsdam, N. Y.
Henry W. Stokes, York Haven Paper Co., 906 Land Title Bldg., Philadelphia, Pa.

Presidents of Affiliated Associations

Fred J. Rooney, The Upson Co., Lockport N. Y. (Amer. Pulp & Pa. Mill Supts. Assn.)
Arthur Havemeyer, Package Paper Co., Springfield, Mass. (American Waxed Paper Assn.)
Donald Lowe, Lowe Paper Co., Ridgefield, N. J. (Cardboard Mfrs. Assn.)
Ralph B. Knott, Eastern Mfg. Co., Bangor, Me. (Cost Assn. of Paper Industry.)
Minor M. Beckett, Beckett Paper Co., Hamilton, Ohio (Cover Paper Mfrs. Assn.)
J. S. Wiley, Berlin & Jones Co., 547 W. 27 St., N. Y. C. (Bur. of Envelope Mfrs.)
R. N. Fowler, Hampden Glazed Paper Co., Holyoke, Mass. (Glazed & Fancy Pa. Mfrs. Assn.)
Irving McHenry, Mid-States Gummed Paper Co., Chicago, Ill. (Nat. Assn. Gummed Tt Mfrs.)

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AMMONIA
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E. C. Tucker, Chemical Paper Mfg. Co., Holyoke, Mass. (Technical Assn.)
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E. H. Naylor, Writing Paper Mfrs. Assn., Springfield, Mass.
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Dr. Hugh P. Baker, Chamber of Commerce of the United States, Washington, D. C.
O. M. Porter, American Paper & Pulp Assn., 18 E. 41st St., New York City.

Salesmen's Association Meeting

Ninth Annual Meeting Marked by Instructive and Inspiring Talks

WHILE James H. Coy, of Chicago, sales manager of the Flambeau Paper Company, was re-elected president for the ensuing year of the Salesmen's Association of the Paper Industry, several changes were made in the official family of that organization at its ninth annual meeting in the East Room of the Waldorf-Astoria Hotel, New York, on February 22. The re-election of Mr. Coy was in keeping with the custom of the Association in having its president serve two terms, and was also a mark of appreciation of the earnest efforts of President Coy on behalf of the Association during the past year and his excellent conduct of the organization's affairs during that period.

Vice presidents were elected as follows: Thomas Compton Walsh, of Boston, of the Hollingsworth & Vose Company, in charge of the New England Division of the Association; Samuel C. Knode, of New York, of the Albemarle Paper Manufacturing Company, in charge of the New York Division; R. T. Houk, Jr., of Dayton, Ohio, of The G. H. Mead Company, in charge of the Miami Valley Division, and Harold R. Knott, of Chicago, of the Eastern Manufacturing Company, in charge of the Chicago Division.

Walter E. Perry, of the Chemical Paper Manufacturing Company and the Crocker-McElwain Company, Holyoke, Mass., was elected chairman of the Membership Committee; F. W. Main, of the Worthy Paper Company, Mittineague, Mass., was elected chairman of the Educational Committee; R. D. W. Ewing, of the American Writing Paper Company, New York City, was elected chairman of the Social Committee, and D. A. Crocker was re-elected secretary and treasurer.

Reports of Divisional Chairmen

The meeting of the paper salesmen was well attended. After calling the meeting to order, President Coy delivered a short address of welcome, and in a few words touched on the work of the association during the year. He then called on the divisional chairmen for reports. Vice president Charles W. Nickenig for the New York Division reported that weekly luncheons had been held during the year which had been fairly well attended. The New York Division had made a small increase in membership during the year, and the fact that the increase had not been larger was not due to any lack of effort on the part of the membership chairman, A. R. Melker, Mr. Nickenig said. Mr. Nickenig recommended that in the future monthly instead of weekly luncheons be held in New York, as he expressed the belief a better attendance could be obtained by less-frequent gatherings.

George J. Cadwell, of the American Writing Paper Company, Holyoke, reported for the New England Division, and said that effort had been made during the year to increase the membership with some success. In the absence of Vice President Walter J. Cox in charge of the Chicago Division, President Coy reported for that division, and stated that regular luncheon meetings had been held by the Windy City group, which had proved very beneficial, and that the membership of the Chicago Division had recorded a gain during the year.

F. W. Main, chairman of the Nominating Committee, was then called upon to make nominations for officers, and after he had read the list put forth by his committee and a round of applause had greeted it, George K. Gibson made a motion that the secretary be instructed to cast a single ballot electing the entire ticket, which was thereupon done amid more applause, thus making the election unanimous.

Mr. Main as chairman of the Resolutions Committee read a touching tribute to the memory of W. S. Cummings, of the Chemical Paper Manufacturing Company, Holyoke, Mass., a leading member of the Salesmen's Association, who died on December 27 last in the Fifth Avenue Hospital in New York City, and during the reading all in the room stood as a mark of respect to the late Mr. Cummings.

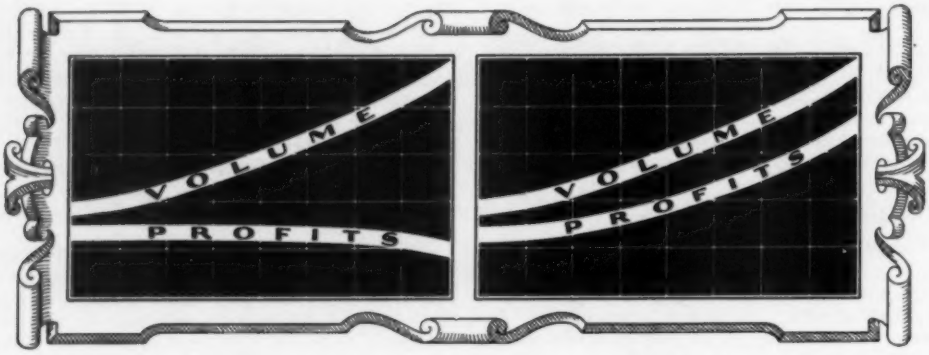
Works and Objects of the Association

George K. Gibson then made a stirring address concerning the work and objects of the Salesmen's Association, in which he emphasized the great amount of benefit paper salesmen can derive from the Association if they would properly take part in its activities. Mr. Gibson told of the excellent results which have been accomplished in Chicago through conferences between mill salesmen and paper merchants in that city, and explained the formation of the Chicago Plan Committee to which are referred all matters of unfair competition, all matters of standardization and all other matters seeking the better relationship and good will between paper mill representatives and paper jobbers. He also expressed the belief that the paper salesman has his greatest opportunity today, pointing out that the biggest problem of the paper industry now is merchandising, in which of course the salesman plays a foremost role.

Automobiles and Telephones

The first invited speaker, O. P. Pearson, statistician of the National Automobile Chamber of Commerce, then was introduced by President Coy, and the eyes of the paper salesmen soon were opened in astonishment by the comparative statistics which the speaker cited. Mr. Pearson made the astonishing statement that there are today more passenger automobiles in the United States than there are telephones, whereas there are 20,125,000 passenger motorcars in this country, there are only 18,500,000 telephones. Every time the telephone rings an automobile has traveled six miles, he asserted. He gave other interesting figures indicating the vast size and scope of the automobile industry, and outlined the many industries which are kept occupied supplying the auto factories with materials.

"Coming to the automobile outlook for the immediate future," he said, "the year 1928, I feel, will equal the year of record production, 1926. The expected increase of activity in the automobile industry should have a stimulating effect on business in general in view of the fact that its influences are widespread in purchasing materials and giving employment to workers on a large scale. It should help to make



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1849

1928 a prosperous year—better than 1927. The paper industry should share this improvement."

Export Channels as an Outlet

J. A. Kavanagh, statistician of the American Paper and Pulp Association, then spoke, and said that the situation in the paper industry should parallel that in the automobile industry. He pointed out that the paper industry has not exploited the domestic and foreign markets as the automobile industry has done, and that under the Webb-Pomerene Act our nation's tariff policy is aggressive for the development of foreign trade, not merely protective against foreign competition, which, he stated, should enable the paper industry to develop to a degree not yet known. Mr. Kavanagh said that the value of paper and paper products produced in the United States amounts to about a billion dollars per year, that the paper industry pays out $600,000,000 annually for raw materials, and about $180,000,000 in salaries and wages. Production of paper in this country last year, he stated, was approximately 23 per cent under the capacity of the mills, and asserted that he believed the direction in which the greatest effort should be made to increase business in paper was through export channels.

Suggest Basing Commission on Profit

Dr. E. O. Merchant, statistician, made a short address in which he referred to the automobile industry's dominating influence on business and on business sentiment, saying that when auto sales are large a great many business men in various lines of endeavor take this as an indication of good trade activity generally, and gauge their operations accordingly. He pointed out how and where the automobile industry is a large consumer of paper, and said that if auto business is to be good this year that the influence on the paper market will be appreciable. He stated that he was bold enough to make the forecast that consumption of paper of all grades in the United States in 1928 will show a five per cent increase over 1927. Despite this he does not expect the rate of paper mill operation will be any larger than last year, owing to the rapid improvement in equipment which should offset the gain in output. He warned the paper salesmen that there will be just as much surplus product in the market during the present year, and that because of this the job of the paper salesman will be no "bed of roses." He expressed the opinion that in order to encourage salesmen to give more thought to profits, he felt a change should be made in the remunerating of salesmen—that they should be paid a commission on the amount of profit accruing to their principals through their sales, and that they should be rewarded for the profits realized for their concern.

Mr. Main then offered a resolution thanking the three speakers for their highly interesting and instructive remarks, and the resolution was approved promptly. President Coy arose and thanked the Association for his re-election, and also had a word of appreciation for the outgoing officers and added that he felt the incoming officers have a year of hope and of progress ahead.

The meeting thereupon adjourned.

Annual Dinner Highly Enjoyable

The annual dinner of the Salesmen's Association of the Paper Industry was given on the evening of February 20 in the Roof Garden of the Waldorf-Astoria Hotel. The attendance was large, and during the serving of an excellent repast an entertaining vaudeville program was rendered by an array of talented artists. The speaker of the evening was F. D. Van Amburgh, editor, author and publisher, who delivered one of the oddest though nevertheless interesting talks that it has ever been the good fortune of this reporter to listen to. The talk was inspirational to an extreme. Mr. Van Amburgh did no preaching, nor teaching, but he did some reaching. He did not moralize, but he commercialized in such a manner that is certain to make any man do better and be better. His subject was, odd enough in itself, "How to Fail." It was an inside inventory, a self-analysis wherein the two greatest words ever uttered by a material philosopher ware prominently played up—"Know Thyself." Each and every serious point made by the speaker was followed by a simile or a short story full of sense and humor. The speaker was applauded vociferously when he had finished.

Woodlands Section Meeting

Great Interest in Well Balanced Program

THE Woodlands Section of the American Paper and Pulp Association held its annual meeting at the Waldorf-Astoria Hotel, New York, on Thursday, February 23, with forenoon and afternoon sessions. Foresters from Michigan, Wisconsin, Maine, Minnesota, Pennsylvania and New York were among those in attendance, and discussed in particular the problem of growing trees to provide a crop of the raw material used by the paper industry. Others present included a number of prominent paper mill executives, and several technical foresters.

Forrest H. Colby, of the S. D. Warren Company, Bangor, Me., discussed the general problem, pointing out that without pulpwood, the paper mills are helpless.

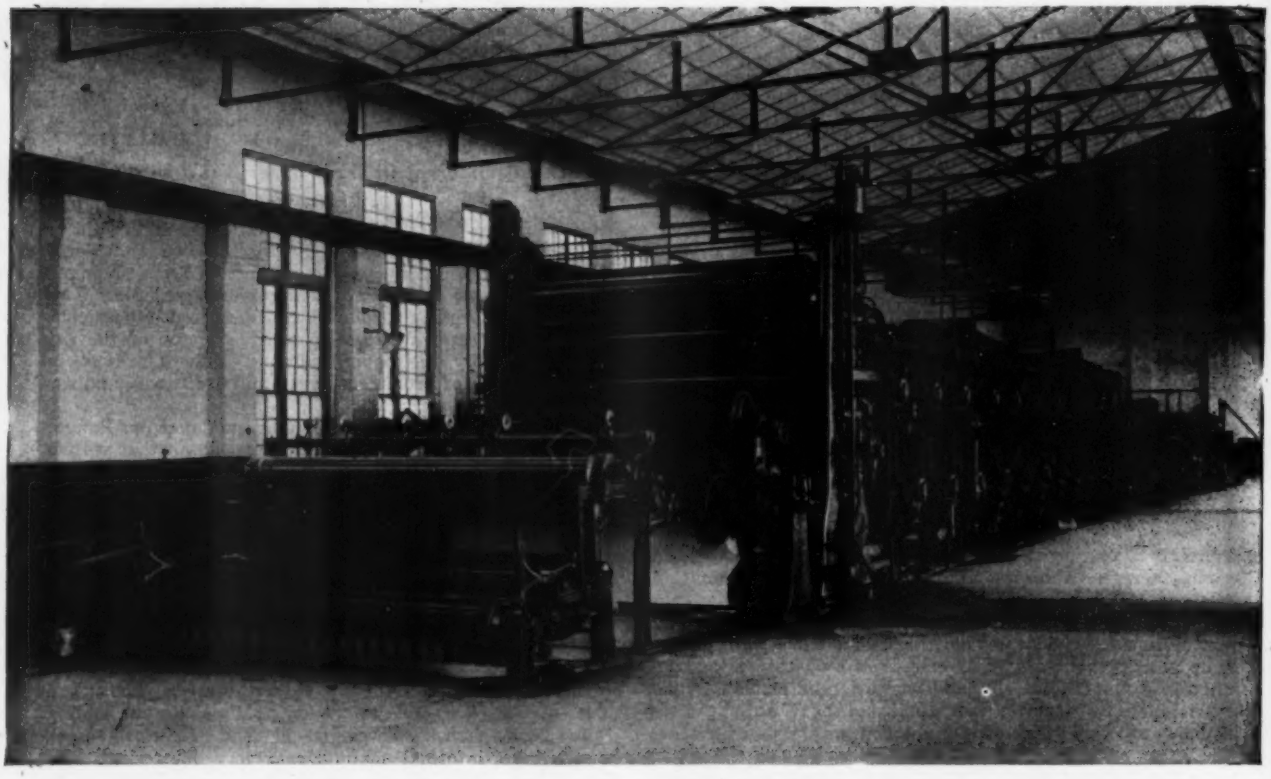
George W. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y., declared it to be an economic waste to deny proper use of public forest areas to industry, and pointed out that proper handling of public forests would allow utilization of the timber and actually improve the condition of the forest.

Julian Rothery, of the International Paper Company; John F. Preston, of the Hammermill Paper Company, Erie, Pa., and W. H. Kenety, of the Northwest Paper Company, Cloquet, Minn., discussed the individual forestry problems of their respective companies, including Canadian as well as United States forestry development. The talks of these gentlemen were informal mainly, but very interesting. Mr. Kenety told of the changes which have been effected in logging operations in the Northwest since his company first was under way, and the numerous improvements that have been made in taking wood out of the forests, preventing fires, and re-planting. He said, in part:

"We spend yearly, approximately, $40,000.00 in fire protection. In this area, it is necessary to take care of outside and intermingled lands as well as our own holdings. We have a corps of men, who are trained in this work as well as towers, telephone lines, trucks, fire pumps, camp units, consisting of tents, cooking utensils, food, supplies, etc. Fire patrol men are stationed at various points, so that they can get to a fire very quickly. The important principle underlying fire protection, is to make sure that every fire is put out on the day on which it originates. We have had as many as five hundred fires in a season, and in no case, in the last five years, has any fire existed for more than a day. Many other agencies, such as railroads, highway departments, state forest services, etc., have co-operated very fully with these organizations of ours. We feel that fires can be kept out if the right organization is employed, and the proper equipment and facilities maintained for detecting fires as soon as they start, and getting a crew of men onto the fire with very little delay.

"Personally, I do not think it is advisable to use pulpwood less than four inches in diameter at the small end. This. in some places, may look as though it meant wasting a lot of wood, but when the cost of cutting, handling, percentage of bark, and the disadvantages in the mill are balanced up against the stumpage value of the small top or small stick I am inclined to think that the larger sized pulpwood will be favored. It would seem that many of our private, state and government officials could, to advantage, spend some little time in studying the operations and costs of using small wood instead of being over-zealous in their belief that they were right in advocating that timber be cut to very small diameters.

"Wood is one of the main items in the cost of paper and a supply of raw material is probably the most important essential in the success of a paper company. The advisability of reforestation, and the handling of timber lands for a new



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crop of wood, is a dollar and cents proposition. It cannot be determined by any other agency than the management itself. Each proposition must be worked out on its own merits. The management of a paper company must give it the same attention and study that it does to the other factors, which mean red or black figures on the balance sheet at the end of the year."

C. W. Hurtubis, of the Hammermill Paper Company, discussed co-operative production of pulp wood by paper companies.

The afternoon session of the Woodlands Association was opened by Prof. A. B. Recknagel, of Cornell University, chairman of a committee to study the question of the formation of a spruce production corporation. He stated that the committee had made progress, with no decision as to what steps if any should be taken. He reported that it is profitable to grow spruce on abandoned farm lands in New York State, and said that in the light of economic development it is not proper to allow these lands to remain idle. Prof. Recknagel stated that it has been demonstrated that on such lands spruce can be grown furnishing the necessary raw material for pulp mills that have no other source of supply. A committee of the New York Section of the Society of American Foresters is now studying this matter and expects to complete its report early in the summer.

Other speakers at the afternoon session were Donald Bruce, of California, who urged that a company should establish its forestry policy upon business principles; S. B. Copeland, of the Eastern Manufacturing Company, Bangor, Me., on "Forest Protection," in which he outlined means of forest fire prevention; Dr. Hugh P. Baker, United States Chamber of Commerce, who spoke on the necessity of forest research; F. J. Sensenbrenner, of the Kimberly-Clark Company, Neenah, Wis., who spoke on "Forest Taxation," and the session closed with an address by D. C. Everest, president of the American Paper and Pulp Association urging that business, as such, should take the leadership in promoting the cause of forestry.

Cost Association Holds Meeting

Twentieth Semi-Annual Meeting Well Attended

THE Cost Association of the Paper Industry held a semi-annual meeting in the Waldorf-Astoria Hotel, New York, on February 22 and 23, two sessions being held. There was a good attendance, and those present listened to instructive speeches on the subject of costs, the speakers bringing out that profits can only be secured through a knowledge of exact costs, and discussing various accountancy problems involved in the computation of such costs.

The first session was opened by Ralph B. Knott, president of the Association, who in a few well-chosen words welcomed the members to the twentieth semi-annual meeting of the Cost Association. He was followed by Thomas J. Burke, secretary of the Association, who presented a "Wage Survey" report and led a discussion on "Labor Turnover in the Pulp and Paper Industry."

The next speaker was T. D. Nevins, of Miller, Franklin & Bassett, Inc., New York, who spoke comprehensively on the subject of "The Distribution of Selling Expenses." A discussion followed this address, in which all the members joined. The meeting thereupon was interrupted for the serving of luncheon, which was held in Room 115 of the Waldorf. Afterward Reginald Trautschold, consulting engineer, spoke on "Cost Reduction in the Power Plant." Mr. Trautschold compared the use of instruments by the management to the use of machinery by the operatives, and drew deductions to emphasize the importance of instrument control in managerial direction of industry. He also described the power plant as a complex unit and analyzed the interest which extends to efficiency in power utilization, and cited specific instances in paper mills where instrument control is practiced and the benefits derived therefrom.

At the second day's session, C. M. Baker, engineer of the American Paper and Pulp Association, spoke on "Cost Reduction by Waste Utilization," and was followed by J. A. Grimes, special representative of the Treasury Department, Washington, D. C., who delivered a highly interesting address on "The Government Plan for Standardizing Depreciation Rates in the Pulp and Paper Industry." Dr. E. O. Merchant, statistician, spoke on "The Business Outlook and Its Bearing on Sales Estimates and Budgets," in which he cited some interesting statistics relating to industrial production and giving his hearers a fairly concrete idea of what to anticipate in the way of business over the next few months.

The meeting was brought to a close by Arthur R. Burnet, statistician, who spoke on the subject of "Cost Production by Waste Utilization."

Luncheon of the Cost Association

Of the various luncheon parties that were arranged at the Waldorf-Astoria during the annual convention of the American Paper and Pulp Association none was more enjoyable or so interesting in every way than that of the Cost Association of the Paper Industry which took place on Wednesday, February 22. At this luncheon Col. B. A. Franklin, vice president of the Strathmore Paper Company, acted as chairman and introduced the speakers who were C. Oliver Wellington and J. P. Jordan.

In introducing the first speaker, who is a partner in the firm of Scovell Wellington & Co., Colonel Franklin spoke of the growing interest in cost work as evidenced by the attendance at meetings of the Cost Association. There was no time in the past when cost accounting had been so much appreciated as it was today.

Divisional Meetings

Writing Paper Manufacturers' Association

D. K. Brown, of the Neenah Paper Company, Neenah, Wis., was elected president of the Writing Paper Manufacturers' Association at the annual meeting of that organization in the Waldorf-Astoria Hotel, New York, on February 22. Mr. Brown succeeds W. M. Crane, Jr., of Crane & Co., Dalton, Mass., who served two terms as president. Col. B. A. Franklin, of the Strathmore Paper Company, Mittineague, Mass., and Fred A. Leahy, of the Eastern Manufacturing Company, New York City, were elected vice presidents, Mr. Leahy being re-elected and Col. Franklin being chosen to succeed Mr. Brown who was elevated to the presidency.

The Executive Committee for the ensuing year is composed of L. C. Anderson, of the W. B. Oglesby Paper Company, Middletown, O.; I. N. Esleeck, of the Esleeck Manufacturing Company, Turners Falls, Mass.; E. P. Bagg, of the Parsons Paper Company, Holyoke, Mass., and C. B. Clark, of the Riverside Fibre and Paper Company, Appleton, Wis., together with the above-named officers. Emmett Hay Naylor, of Springfield, Mass., was again chosen secretary and treasurer.

Aside from its general meeting, the Writing Paper Manufacturers' Association held meetings during the convention of its Fine Paper Division and Sulphite Bond Division, at which subjects of interest to the respective divisions were considered.

Cover Paper Manufacturers' Association

All officers were re-elected for the ensuing year at the annual meeting of the Cover Paper Manufacturers' Association, held on Tuesday, February 21, at the Waldorf-Astoria Hotel, New York. Minor M. Beckett, of the Beckett Paper Company, Franklin, Ohio, was again elected president; Col. B. A. Franklin, of the Strathmore Paper Company, Mittineague, Mass., was re-elected vice president, and Emmett Hay Naylor, of Springfield, Mass., was again named secretary and treasurer.

President Beckett, Vice President Franklin and Willis H. Howes, of Knowlton Bros., Inc., Watertown, N. Y., compose the Executive Committee of the Association.

Tissue Paper Manufacturers' Association

The Tissue Paper Manufacturers' Association held its annual meeting in New York on February 21 in the Waldorf-

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W. B. MILHAM, *Vice-President* C. A. FOX, *Secretary and Treasurer*
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High Grade Machine Finish and Super Calendered
BOOK ◆ CATALOG ◆ ENVELOPE
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Specializing in Light Weights and Opacity Papers

Astoria Hotel, at which all the officers and Executive Committee members were re-elected for the ensuing year. Z. W. Ranck, of the Crystal Tissue Company, Middletown, Ohio, was again chosen president, while J. N. Conway, of the Hoberg Paper and Fibre Company, Green Bay, Wis., and John M. Rieg, of the Erving Paper Mills, Erving, Mass., were re-elected vice presidents, and Emmettt Hay Naylor was again named secretary and treasurer.

These officers, together with E. H. Benson, of the Regal Paper Company, Pulaski, N. Y., and E. J. Kiefer, of the Port Huron Sulphite and Paper Company, Port Huron, Mich., comprise the Executive Committee.

American Waxed Paper Association

R. A. Donnelley, of the Central Waxed Paper Company, Chicago, was elected president of the American Waxed Paper Association at the annual meeting of that organization in the Waldorf-Astoria Hotel, New York, on February 23, succeeding Arthur Havemeyer, of the Package Paper Company, Springfield, Mass. Mr. Havemeyer was elected vice president, as was also C. F. Wright, of the Waterproof Paper & Board Company, Cincinnati, Ohio.

The above officers, with W. L. Carter, of the Nashua Gummed and Coated Paper Company, Nashua, N. H.; R. A. Hayward, of the Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich., and W. J. Eisner, of the Newark Paraffine & Parchment Company, Newark, N. J., compose the Executive Committee for the coming year.

United States Pulp Producers' Association

At the annual meeting of the United States Pulp Producers' Association, held on February 23 in the Waldorf-Astoria Hotel, New York, W. H. Savery, of the Shenandoah Pulp Company, Harpers Ferry, Va., was elected president for the ensuing year, succeeding L. M. Alexander, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis., and N. S. Stone, of the Wausau Sulphate Fibre Company, Mosinee, Wis., was elected vice president to succeed Mr. Savery. O. M. Porter, of New York City, was elected secretary and treasurer.

The Executive Committee consists of President Savery, Vice President Stone, J. P. Hummell, of the Hummell-Ross Fibre Corporation, Hopewell, Va.; Norman W. Wilson, of the Hammermill Paper Company, Erie, Pa., and J. M. Ward, of the Detroit Sulphite Pulp and Paper Company, Detroit, Mich.

Binders' Board Manufacturers' Association

The Binders' Board Manufacturers' Association held its annual meeting at the Waldorf-Astoria Hotel, New York, on February 22, with a good attendance of the membership present. E. C. Betz, of the Consolidated Paper Company, Monroe, Mich., was elected president for the ensuing year to succeed Leigh H. Davey, of the Davey Company, Jersey City, N. J., and E. H. Norton, of the C. H. Norton Paper Company, North Westchester, Conn., was elected vice president. O. M. Porter of New York, was re-elected secretary.

Southern Kraft Manufacturers' Association

The annual meeting of the Southern Kraft Manufacturers' Association was held on the afternoon of February 22 in the Waldorf-Astoria Hotel, New York, and at the election of officers which followed a general discussion of prevailing business conditions A. C. Goodyear, of the Bogalusa Paper Company, Bogalusa, La., was chosen president for the ensuing year, and P. M. Tallon, secretary and treasurer of the Hummell-Ross Fibre Company, Hopewell, Va., was elected vice president. C. E. Dobson, of 1007 New Orleans Bank Building, New Orleans, La., was named secretary and treasurer.

Dr. Arthur St. Klein, of Berlin-Dahlem, Germany, who is widely known as a consulting chemist in the pulp and paper industry and through his many contributions to the literature, was married in London, England, on February 7, to Miss Dora Reinhart, of Hermsdorf u. d. Kynast, Silesia. Doctor Klein is the Berlin correspondent of THE PAPER INDUSTRY, which is happy to join his numerous friends in wishing him and Mrs. Dr. Klein many years of wedded bliss.

Paper Merchants Meet and Elect

National Paper Trade Ass'n Celebrates Silver Anniversary

THE National Paper Trade Association held its twenty-fifth or Silver Anniversary convention at the Waldorf-Astoria Hotel in New York City on February 20-22, with an unusually large attendance of members from various parts of the country. The convention was made a gala affair in celebration of the Association's quarter of a century existence, and a particularly interesting program was conducted—business as well as social—for the instruction and entertainment of the conventionites.

At the annual election of officers on February 22, W. Noble Gillett, vice president of the Chicago Paper Company, Chicago, was elected president of the Association for the ensuing year, succeeding J. C. Mallalieu, of George W. Millar & Company, Inc., of New York City. Kit S. Warner, of John F. Sarle, Inc., New York, was elected vice president in charge of the Fine Paper Division to succeed Mr. Noble, and Harry W. Mathewson, of the Paper Supply Company, Minneapolis, Minn., was re-elected vice president in charge of the Wrapping Paper Division.

A feature of the general business meeting of the association was the introduction of Frank E. Floyd, of Indianapolis, Ind., who as announced recently will become secretary and general manager of the National Paper Trade Association, effective March 1, 1928. Mr. Floyd has had 31 years' experience in the paper merchandising field, having been associated for that period of time with the Crescent Paper Company in Indianapolis.

The social program of the paper merchants' convention included the Silver Anniversary Supper and Dance at the Biltmore Hotel on the evening of February 22, which was preceded by a theatre party at the Selwyn Theatre where "The Royal Family" was witnessed.

Mill Supply Dealers' Dinner

One of the enjoyable social events of Paper Convention Week in New York was the twentieth annual dinner and entertainment of the New York Association of Dealers in Paper Mill Supplies, Inc., which was given on the evening of February 22 in the North Ballroom of the Hotel Astor. This dinner always is arranged for Paper Week so that the supply dealers in the metropolitan area can entertain their mill friends in New York for their convention, and the affair is looked forward to as one of enjoyment and merrymaking.

More than 200 were present at the dinner. A sumptuous repast was served, during which the complete cabaret review of the Swanee Club, a popular dining and dancing palace in New York, was put on, an elevated stage having been erected in the center of the dining room. There were talented vocalists, clever dancers and a dashing chorus of singing and dancing girls, with a negro jazz orchestra supplying the music. A souvenir program and menu booklet was distributed which was a handsome sample of the printer's art.

The committee of the Association having the dinner in charge consisted of Walter H. Martens, of George W. Millar & Company, Inc.; Charles Passannante, of the Wilson Paper Stock Company, Inc., and Alfred J. Moran, of A. J. Moran & Company, Inc. At almost every table were purchasing agents and other paper mill executives as invited guests of the supply dealers.

Chairman of British Technical Section Guest of T. A. P. P. I.

Major William Nash, chairman of the Technical Section of the Papermakers' Association of Great Britain and Ireland, and president of William Nash, Limited, Cray Valley Paper Mills, St. Paul's Cray, Kent, England, has been visiting pulp and paper mills in the United States and Canada. In passing through New York on Monday, February 27, he was the guest of the Technical Association of the Pulp and Paper Industry at a luncheon in the Chemists' Club which was attended by

Seaman Paper Company

U. S. A.

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Ronald G. Macdonald, secretary; W. G. MacNaughton, George D. Bearce, B. T. McBain, Oliver M. Porter, secretary of the American Paper and Pulp Association; W. E. Byron Baker, J. A. DeCew, T. Linsey Crossley and T. J. Keenan.

Secretary Macdonald introduced Major Nash and in a few well chosen words expressed the pleasure it afforded the gathering to greet him as the representative of the British Technical Section, to which Major Nash made a graceful response. He spoke in admiration of the development of the pulp and paper industry in North America and referred particularly to the progress of the Technical Section whose guest he was at the luncheon. There were a number of features of the work done by T. A. P. P. I. which had impressed him very favorably and that he thought might be well worth copying in England, as for instance the Service to Members plan.

Several of those present made inquiry of Major Nash concerning British paper mills and their products to which he very obligingly responded. In this way there was an interesting and valuable interchange of views concerning the characteristics of esparto pulp which is employed so extensively in the manufacture of a large variety of British papers, chiefly book paper and the cheaper kinds of writing paper. It was remarked by the guest that there were no wood fiber mills in Great Britain, but a groundwood mill had been nearly completed on the Medway, near Gravesend, in which spruce wood from Finland would be used as raw material. Edward Lloyd, Ltd., has also placed contracts for the construction of a groundwood mill in connection with its Sittingbourne plant in Kent.

Notes of the Convention

An unfortunate occurrence at the convention of paper manufacturers and merchants in New York City was the sudden illness of W. S. Lee, western sales manager of the Sealright Company, of Fulton, N. Y., who has his offices in the Conway Building, Chicago, Ill. Mr. Lee came to New York to attend the convention and was stricken on February 20, the first day of the convention and was taken from his hotel quarters to the Flower Hospital in New York where he remained for four days, and his physicians advised him to stay in New York for ten days or so in order that they might keep him under observation.

Tag board manufacturers held an informal conference with a view to the eventual formation of an association. No official action was taken, however. Informal conferences were held of bristol board manufacturers, the Paper Makers' Advertising Club, and special groups of various associations.

Among those who held "open house" at the Waldorf-Astoria Hotel during the convention were the Hudson Bag Company, of New York City, and its subsidiary, the Moore & Thompson Paper Company, who received in Room 467; W. R. Lenderking, general sales manager of the Tulip Cup Corporation, in suite 1170-71 where a fine display of Tulip products was to be seen; the Union Waxed and Tissue Paper Company, of Hamburg, N. J., in Rooms 1066-67; the Howard Paper Company and the Maxwell Paper Company, of Ohio, in Parlor 424, where Ward Howell, Howell H. Howard and Fred P. Whiteley were in charge, and J. V. Cuskey, sales manager of the Individual Drinking Cup Company, Easton, Pa., in Room 457.

Noticed among those at the convention was Herman Orchard, president of the Orchard Paper Company, St. Louis, Mo., who came up from Palm Beach to mix in with the conventionites, and who announced that his company is enlarging the scope of its manufactured products, adding new equipment, machinery, etc., that will cost approximately $25,000. Glassine bags and a wide variety of wrapping specialties will be added.

There was a group of paper manufacturers and prominent paper jobbers who every winter are the guests of the Sissons, of the Racquette River Paper Company, Potsdam, N. Y., at their hunting lodge in the wilds of Northern New York, who returned the Sissons' hospitality by entertaining them at a dinner in Keene's Chop House in New York on the evening of February 22. A feature of the dinner was the showing of several reels of moving pictures taken at the gathering at the hunting lodge of the Sissons several months ago.

The Oxford Paper Company displayed several reels of movies entitled "Pulp and Paper Making," in which was shown the manufacture of pulp and paper from the standing tree in the Maine forest to the printing of book paper, in the Myrtle Room of the Waldorf on the last day of the convention, February 23. The pictures were taken at the Oxford woodlands and mills in Rumford, Me.

Dr. Ing. Paul Priem

Dr. Paul Priem, managing director of the wood grinding and paper machinery department of the well known firm of J. M. Voith, Heidenheim, Germany, passed away at his home in that city on Thursday, February 2, aged sixty-two years.

Doctor Priem, who was well known to pulp and paper manufacturers both in Europe and North America, was the inventor of the hydraulic machine grinder which created such a profound impression some twenty years ago. He also conceived the idea of the continuous speed type grinder, which, together with the hydraulic magazine grinder, was the crowning achievement of his career and the means of directing the art of wood grinding into new and advanced channels.

But there is scarcely a branch of pulp and paper manufacture which has not benefited by Dr. Priem's inventive genius. It may not be generally known that he was the first to take out patents on an electric sectional drive for paper machines and was also the first to facilitate the changing a fourdrinier wire by moving the whole wire part out of the machine laterally. The large capacity inward flow paper machine screen is another invention which was put into practical use through his efforts; it is not too much to say that it has been by these and similar inventions that present-day progress in building paper machines of ever-increasing speeds and widths has been made possible.

In recognition of his great achievements in engineering, through the development of machinery for the pulp and paper industry, the University of Darmstadt in 1926 conferred on him the honorary degree of Doctor of Engineering.

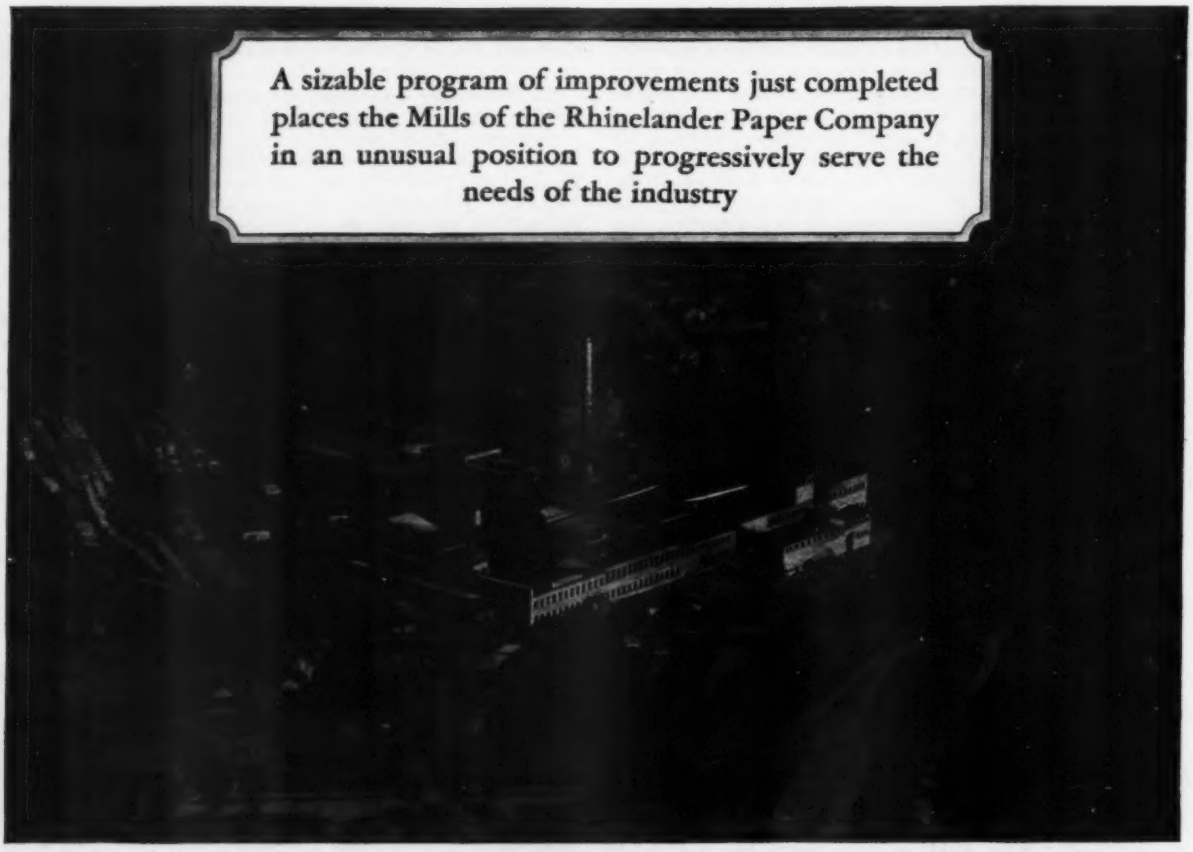
Doctor Priem is survived by his wife, Mrs. Julie Priem, of Heidenheim, Germany.

National Forestry Convention

Forestry as a factor in flood control, industrial prosperity, and the economic use of land resources, featured the 1928 annual meeting of the American Forestry Association at St. Louis, Mo., February 17 and 18, jointly with the Missouri Forestry Association.

The clearest explanation yet given of forestry as an aid to flood control was voiced by Col. W. B. Greeley, Chief of the United States Forest Service, in a paper read by Major R. Y. Stuart, assistant forester. Col. Greeley pointed out that while the immediate need in the Mississippi basin is for the engineer, a specific program of forest restoration and extension is necessary to the ultimate control of floods. There should be no exaggerated notions of what forestry can do in controlling the behavior of streams, and no unwarranted assumptions that forestry, or any other form of land use, can take the place of engineering structures in protecting areas subject to overflow from the flood discharges which must always be anticipated in the Mississippi River. Forests hold back run-off and bind soil in place better than any other form of vegetative cover, usually retard the melting of snow, and reduce the run-off through the amount of water drawn up from the soil and transpired into the air from the leaves of trees. These same factors, particularly the root systems and the amount of humus constantly fed into the soil, make the earth

A sizable program of improvements just completed places the Mills of the Rhinelander Paper Company in an unusual position to progressively serve the needs of the industry



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ONE of the finest manufacturing units in the country —the last word in mechanical equipment and competent paper men—is made workable and available to your needs because this combination is motivated by the "will to serve." Alert, progressive, eager to work with you to make this mill produce the kind of commodities you require. We'd like to do business with you on the very human basis that has built this great mill and its many fine friendships.

At Rhinelander, Wisconsin

beneath a forest more porous and able to hold more water before becoming saturated. We know that these same influences protect the soil from the eroding action of water and hold it in place to a much greater degree than where the soil has no such protective covering.

The meeting ground between flood and forestry has already been laid down in the general policy of the United States. Our organic legislation has defined the regulation of streams and control of floods as one of the specific purposes of federal activities in forestry. It now remains to define this relationship in a specific plan for the Mississippi basin.

Hon. John M. Parker, former Governor of Louisiana, termed the Mississippi Valley project America's greatest conservation problem. Aldo Leopold, of the Izaak Walton League of America, spoke of the sportsman's interest in flood control.

Forestry was discussed from both the industrial and public viewpoints during the morning session. Dr. Wilson Compton, secretary and manager of the National Lumber Manufacturers Association, spoke on "What Industrial Forestry Asks of the Public", and S. T. Dana, Dean of The Michigan Forest School, presented the subject "What Public Forestry Asks of the Lumberman". In brief, Dr. Compton declared that industrial forestry has a right to ask of the public, first, tolerance and understanding, and secondly, a sane conception of industrial forestry, free from sentimental extravagances. He further stated that the public should extend to private timberland owners taxation adapted to the peculiar nature of timber property and adequate protection against the menace of forest fires. Good public manners in and toward the private forests and suppression of the fallacious doctrine that curtailment of the use of forest products will encourage the growing of forests, are also asked by industrial forestry.

Series of National Forests to Be Established

A program for a series of National Forests involving the expenditure of $40,000,000 was inaugurated today by the National Forest Reservation Commission. This provides for the completion of the existing forests which are to be supplemented by like series in the Coastal Region of the Southern States and in the former pineries of the Lake States. This program has for its ultimate objective the acquisition by the Federal Government of 9,600,000 acres of additional lands in these sections of the United States. Of this area about two-thirds or 6,000,000 acres is to be acquired for stream protection in the eastern States of which 4,000,000 acres will be for the consolidation of existing National Forests and two million acres will be for the establishment of new units. The creation of new National Forests in the Pine Regions of the Southern and Lake States will embrace 2,500,000 acres. While 1,100,000 acres are to be acquired for the consolidation of existing National Forests in the Great Lakes region.

As the first step in such a program authorization was given for the establishment of two such new forests in South Carolina; three in Louisiana; and two in Michigan, all in the pine regions and intended to serve not only for the production of timber, but to indicate especially in the Southeast to the private owners of nearby woodland how their own lands can be most profitably managed as timber producing properties. This series will complement the National Forests of New England, of the Lake States, and of the Appalachians and Ozarks and gives a unified National Forest program for the entire eastern United States.

The Commission also authorized the purchase of 23,977 acres of land as additions to established National Forests at an average price of $1.62 an acre. Of this area 19,994 acres are in Cook, Lake, and St. Louis counties, Minnnesota, as additions to the Superior National Forest; 3,960 acres are in Oscoda and Ogemaw counties, Michigan, as additions to the Michigan National Forest; and 23 acres in Tucker County, West Virginia, as an addition to the Monongahela National Forest but to be used as a nursery site for growing tree seedlings, to be used for planting the 120,000 acres of untimbered land, in part abandoned farming land, acquired as parts of these eastern National Forests. The Commission also recommended the transfer of 13,600 acres of public domain to the Big Horn National Forest in Wyoming; and approximately 100,000 acres to the Fremont National Forest in Oregon.

Forestry Conference at Milwaukee

An important meeting in the forestry movement will be held at Milwaukee, Wis. March 28 and 29, under the auspices of the Chamber of Commerce of the United States and the Milwaukee Association of Commerce.

This meeting is of particular interest in that the large number of paper mills in Wisconsin will have representatives in attendance. Reforestation in this state is highly important to the industry, as Wisconsin is among the largest pulp-producing states.

American Paper Mchy. and Engineering Works

H. D. Wells, associated with Trimbey Machine Works and H. G. Rohde, formerly associated with the Farrel Foundry & Machine Co., have organized the American Paper Machinery and Engineering Works, and are building a modern manufacturing plant at Glens Falls, N. Y. for the purpose of producing a line of superior machinery for paper mills.

Mr. Wells, mechanical and sales engineer, is well known to the paper trade, having represented Trimbey Machine Works and Glens Falls Machine Works during the past fifteen years. He is one of the former owners of the Glens Falls Machine Works and has had wide experience in the machinery field, also in the manufacture of paper; a combination unexcelled for building the best in paper mill machinery. He is well versed in the requirements of paper mills.

Mr. Rohde, mechanical and steam engineer, has had wide experience in both machinery and the manufacture of paper; having been associated with Farrel Foundry and Machine Co., Allis Chalmers Co., National Aniline and Chemical Co., Arrowhead Paper Mills and Nekoosa-Edwards Paper Co.

This company's line of machinery includes continuous filters, pulp screens, pulp thickeners, pulp washers, save-alls, pulp wood grinders, rotary sulphur burners, pulp presses, wet machines, plug valves for stock, centrifugal stock pumps, rotary pumps.

The American Paper Machinery and Engineering Works will send a questionnaire upon the request of any paper mill that would like to increase its earnings. The information submitted will be kept confidential.

Edward Archie Jones

Edward Archie Jones, president and treasurer of E. D. Jones & Sons Co., Pittsfield, Mass. passed away recently while seated in his automobile, as the result of a heart attack.

Mr. Jones was born in East Lee, Mass., November 3, 1863. He attended the Peekskill Military Academy and was graduated from the Massachusetts Institute of Technology in 1887. Shortly thereafter he became associated with his father, Edward D. Jones in the manufacture of paper mill machinery, and upon the death of his father in 1904 he assumed active management of the business.

Mr. Jones was well known in the industry for his many sterling qualities and under his administration E. D. Jones & Sons Co. has enjoyed an exceptionally large share of business and prosperity. He was connected with a number of financial and business institutions in a directorate capacity.

The widow and a brother survive him.

Mrs. Hugh P. Baker

Mrs. Hugh P. Baker, wife of Dr. Hugh P. Baker, of the United States Chamber of Commerce, and former Secretary of the American Paper and Pulp Association, passed away in New York City, February 24. Mrs. Baker's death was very sudden, resulting from complications following a minor operation. The body was taken to Taylor's Falls, Minn. for interment.

Mrs. Baker was a woman of charming manners, whose chief pleasure was in the family circle, and her loss will fall heavily on her husband, son and daughter who survive her.

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The Wonders of Modern Paper Mills

Anglo-Canadian and Ste. Anne Mills Embody the Latest Developments in Pulp and Paper Making Practise

TO THE practical paper maker, probably the most interesting angle in a period such as the one we are now going through is that of progress in the lay-out and construction of new mills and in the continual development and improvement of processes and equipment. Very great strides have been and are still being made in this direction, each new mill showing improvement over its predecessors. Two of the latest units to come into production in Canada, the plants of the Anglo-Canadian Pulp and Paper Mills, Limited, at Quebec City, and of the Ste. Anne Paper Company, Limited, at Beaupré, on the St. Lawrence River, twenty miles below Quebec, are the very last word in pulp and paper making technique and embody a number of unique features which make them of outstanding interest amongst their contemporaries.

Anglo-Canadian's Compact Arrangement

The most striking feature of the Anglo-Canadian mill is undoubtedly its compactness, the whole plant, including groundwood, sulphite and paper mills, machine shop, storeroom, hospital, power sub-station and general offices being housed in a building 850 feet long by 580 feet wide. It is situated in the historic old city of Quebec, on the North shore of the St. Charles River at its confluence with the St. Lawrence. The mill site has a total area of 96½ acres, of which 88 acres were reclaimed from tidal flats by filling with sand pumped from the river bottom along the wharf, 1,800,000 cubic yards of sand being required for filling purposes. The mill is built on concrete piles aggregating about twenty-five miles in length. The first of these piles was driven on November 21, 1926, and just one year and eighteen days later, on December 9, 1927, the first paper was coming off the machines.

When the four paper machines are tuned up to their normal speed, they will have an output of 500 tons of standard newsprint per twenty-four hours. The mill has been so designed, however, that its capacity can be increased to 1000 tons daily by the installation of four additional paper machines and the required additional grinders, sulphite digesters, etc., at a comparatively low construction cost. The whole mill, with the exception of the digester operating floor, acid plant, wood room, grinder charging floor and shipping room, are on the same level; and so compact is the arrangement of the various units that any point in the mill can be reached from any other point in not over two minutes. As to the finishing room, it has been eliminated entirely, the rolls being wrapped in the machine room itself, just back of the rewinders, and then lowered to the shipping room.

St. Anne Has Unique Machine Drive

The general lay-out of the Ste. Anne mill also is exceptionally good, being extremely compact, yet without any crowding. As a matter of fact, the impression on going through was rather one of roominess, due to the fact that the machinery has been disposed so as to be easily accessible from all sides. The most interesting feature of the plant is the drive used for the paper machine dryers. The forty-six drying cylinders are driven by twenty-three eighteen-horsepower direct-current motors, which are not tied-in to one another electrically but are synchronized by the top and bottom dryer felts. This arrangement, which was designed at the Dominion Engineering Works, Lachine, Que., is absolutely unique at the present time and is proving highly satisfactory.

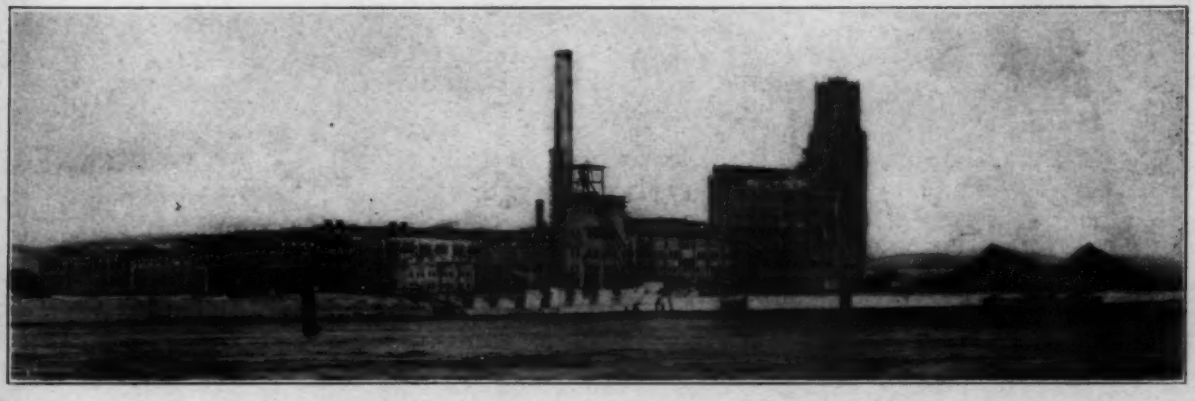
Tall Tower Distinguishes Anglo-Canadian Mill

The first impression gained on catching sight of the Anglo-Canadian mill is one of pleasure and satisfaction for the eye: the architect has not contented himself with merely designing a building suitable for making paper as efficiently as possible, he has combined beauty with usefulness. One very striking and unusual feature resulting from this is that, with the exception of the wood pile, every part of the mill is completely enclosed and roofed over, even to the acid storage tanks. The acid towers and the water tank, which are very conspicuous about all other large news and sulphite mills, are hidden from view in the tall tower, 225 feet high.

The Sulphite Plant of Anglo-Canadian

Wood from the Montmorency limits of the company is water-driven in four-foot lengths down the Montmorency River to a point a few miles above Quebec, where it is barked and shipped to the mill by rail. It is put through a washing drum 12′ x 45′ of new design by Wm. Hamilton Ltd. Drum and drive on roller bearings reducing power by 30 per cent over similar size drums, and discharged on a conveyor which brings it either to the chippers or grinders, as the case may be.

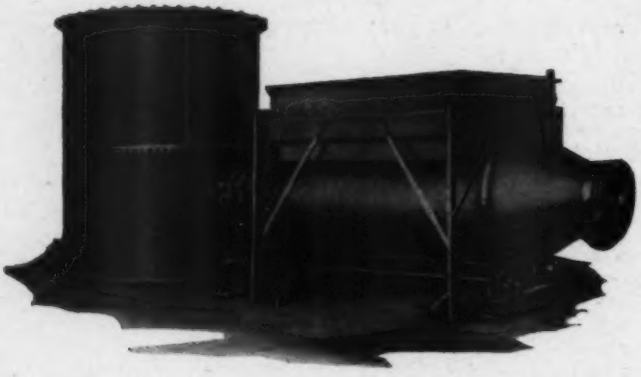
The wood for the sulphite mill goes to two 110-inch Water-



General view of the Anglo-Canadian Pulp & Paper Mills, Ltd., taken from across the St. Charles River

PASCOL
PORT ARTHUR SHIPBUILDING COMPANY LIMITED
PORT ARTHUR, ONT., CANADA

PASCOL ROTARY SULPHUR BURNERS



at Ste. Anne

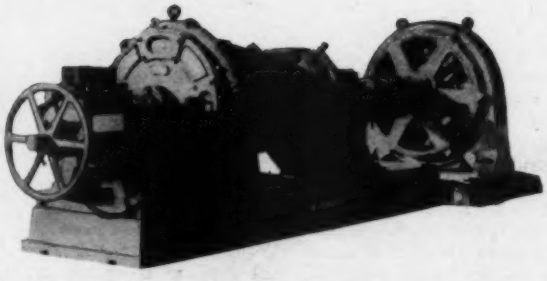
A double unit, hopper feed, Pascol Rotary Sulphur Burner is in operation at the plant of the Ste. Anne Paper Co.

PASCOL JORDANS

at Anglo-Canadian

Pascol Jordans are installed in the mill of the Anglo-Canadian Pulp & Paper Mills, Limited

24 Pascol Jordans have been purchased by the leading Canadian Paper Mills during the past three years



PRODUCTS

Pulpwood Grinders — Pascol Coarse Screens — Rapid Beaters
Wet Machines — Flat Screens — Bull Screens — Holland Beaters
Jordan Engines — Rotary Pulp Screens — Bellmer Bleachers
Hydraulic Presses — Hayton-Pascol Centrifugal Pumps — Deckers
Rotary Bleaching Boilers — Stock Washers — Accumulators — Pulp Trucks
Press, Felt and Wire Rolls of all Types
Acid Resisting Bronze Castings

PORT ARTHUR SHIPBUILDING COMPANY

LIMITED

PORT ARTHUR, ONT., CANADA

ous chippers equipped with chip breakers, and room has been provided for a third one when increased capacity will require. The chips are screened through two Waterous screens, and the oversize chips are passed through a Waterous chip-crusher and returned to the main stream from the chipper. The chips are then elevated to the rectangular bin extending the full length of the digester house and provided with a hopper directly over each digester for charging the latter. The conveying equipment was furnished by Wm. Hamilton Ltd. Even distribution of the chips throughout the length of the bin is accomplished by means of a Link-Belt tripper and conveyors furnished by Wm. Hamilton Ltd. which may be placed at any desired position along the conveyor running over the bins. An air space is left between the walls of the bin and the outer walls of the building, thereby ensuring circulation of relatively warm air and removing any danger of the chips freezing in the bin during a cold spell.

A few of the twenty Waterous hydraulic magazine grinders driven in pairs by ten 2600 h. p., 6600 volt Westinghouse synchronous motors at Anglo-Canadian Pulp & Paper Mills, Ltd.

The acid-maker, who is a familiar figure in practically all sulphite mills, is not to be seen here. The two Glens Falls type of rotary sulphur burners, which are provided with melters straddling the burners and using the radiated heat to melt the sulphur, are situated on the same floor as and right next to the digester operating floor, and it is part of the sulphite cook's duties to attend to the acid making, thus ensuring perfect co-ordination between the operation of the sulphite plant and digester room. The gas coolers are situated at a point about halfway between the burner room and the ground floor, while the acid pumps and gas fan are on the ground floor. The raw acid is made in the usual type of two-tower Jenssen acid system, but instead of the usual recovery tower, there are two Chemipulp acid accumulators in which the raw acid absorbs the hot gas and liquor relieved in the course of the digestion. The acid is thus partly heated up when it is pumped into the digester, resulting in the saving of considerable heat.

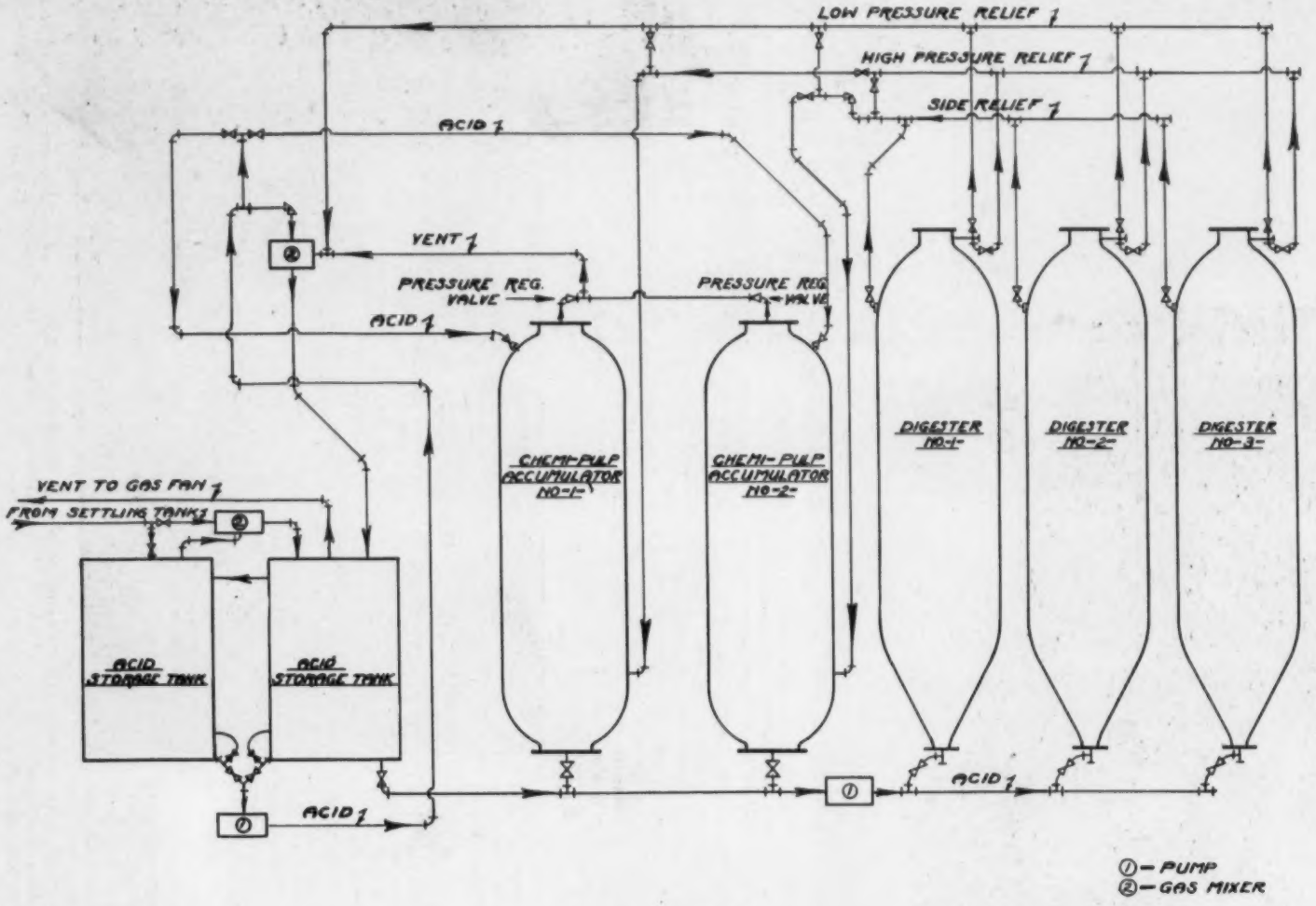
The chips are cooked in four Horton digesters, 16 feet in diameter and 54 feet high. At the end of the cook, the pressure is relieved to about 15 pounds per square inch, the digester is filled with cold water and then emptied into the rectangular blow-pit where the pulp is washed. In order to remove the stock from the blow-pit, it is delivered by light spiral screws into a bucket-elevator or "pulp digger," which raises it on to a conveyor. The pulp-digger, including the spiral screws, slowly travels along the length of the blow-pit. The stock is delivered by the conveyor to a pulp separator to disintegrate the fiber bundles. This apparatus consists of a cylinder about 20 feet long by 3 feet in diameter, with inwardly projecting fingers and an axially disposed rotating shaft also provided with wooden fingers. Relieving the pressure to such a low value, though it entails a little more handling of the stock than the usual practice of blowing at about 50 pounds, gives a stronger and better fiber, confirming the experimental results recently published by Dr. D. E. Cable, of the Oxford Paper Co.

The stock is run by gravity from the separator to a battery of four knotters and thence to four Bird centrifugal pulp screens, and then passes to American filters which thicken it to the desired consistency. This type of filter is used extensively for the separation of slurries in the mining industry. Its application to the dewatering of pulp was developed by the United Filters Corporation in co-operation with the Abitibi Power and Paper Co., when Mr. R. A. McInnis, general manager of the Anglo-Canadian Pulp and Paper Mills, Limited, was mill manager at Iroquois Falls. After passing through the American filter, the sulphite pulp is then ready for mixing with the groundwood and sending to the paper machines.

Anglo-Canadian Grinder Room

To those who are accustomed to the old type of grinder room, this part of the Anglo-Canadian mill is a revelation, there being not the least sign of mist, and atmospheric conditions being just as comfortable as in any other part of the mill, as can be readily judged from the accompanying picture,

Four of the American Filters in which the groundwood and sulphite are dewatered at the Anglo-Canadian Pulp & Paper Mills, Ltd.



FLOW DIAGRAM
OF
CHEMI-PULP HEAT AND GAS RECOVERY SYSTEM
INSTALLED BY
CANADIAN STEBBINS ENGINEERING AND MFG. CO LTD.
MONTREAL, P.Q.

which was photographed when the mill was operating normally. The wood is ground in twenty Waterous hydraulic magazine grinders, driven in groups of two by ten 2600-horsepower Westinghouse motors. The grinder room is equipped with travelling cranes and the overhead track so disposed that manual handling of heavy loads is entirely eliminated, as the cranes can pass between the several lines of grinders.

Wet end of No. 1 paper machine at Anglo-Canadian Pulp & Paper Mills, Ltd.

After passing through the bull screens, the groundwood is screened in a battery of eight Bird centifugal pulp screens, and is then thickened in a battery of six American filters. The screen and filter room may rightly be considered the hub of the mill, being practically surrounded by the grinder room, sulphite mill, boiler room, paper machine room and mill offices, and from it any other point in the mill can be reached in 60 seconds. It contains a panel with recording flowmeters, stock-level indicators, integrating wattmeters, etc., so that operating conditions all over the mill can be seen at a glance.

The grinder room and charging room are provided with a Ross ventilating system consisting of complete supply and exhaust arrangement. The exhaust system draws air from the upper part of the grinder magazines and in addition, exhausts from the upper part of the grinder room. Supply system draws air from out of doors and discharges it to both the grinder and charging rooms.

Many Interesting Features in Machine Room

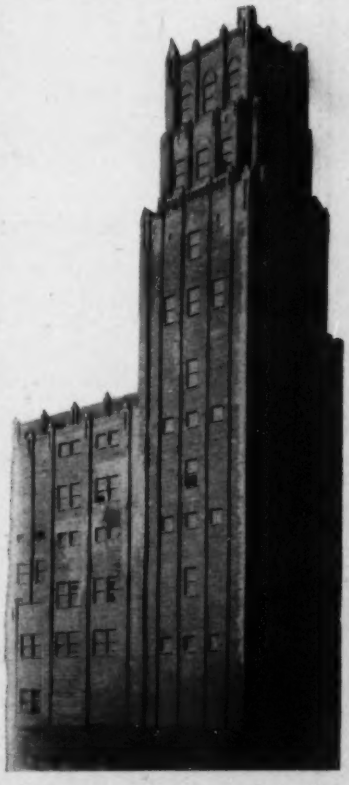
Coming now to the paper machine room, the first feature is the absence of machine chests. The stock from the filter chests is passed through Trimbey consistency regulators to the Trimbey automatic metering and proportioning systems, one for each pair of machines, to the mixed stock chest, through Bird screens, of which there are three for each machine while room has been provided for installing a fourth should this become necessary when the machines are speeded up, and is delivered on the machines from Van de Carr slices. There are four 234-inch Walmsley machines designed to run at a speed of 1400 feet per minute. The first machine began making paper on December 9th, 1927, just one year and nineteen days after starting the construction; the second machine was put into operation about one month later, and the third and fourth are expected to come into production very soon.

These machines are the very last word in design and construction. Each one is equipped with Van de Carr inlet, removable fourdrinier, suction couch roll, suction first and second presses, reversing third press, and forty-six 60-inch dryer rolls. The table rolls are mounted on ball bearings, the dryer felt rolls and wire rolls on roller bearings, and the dryers on plain bearings which are lubricated on both the front and back side of the machine by a Bowser automatic oiling system. When starting up, or after a break, the paper is threaded through the third press and dryers by means of a rope carrier. A Wm. Hamilton, 28 ton, roller bearing truck is provided for handling calender rolls.

The drying steam is distributed to the cylinders by means of a Farnsworth system, in which the wet-end dryers are supplied with steam which has already passed through the dry-end dryers, a counterflow separator ensuring the removal from the steam of the condensate which has been produced in the dry-end dryers. A novel feature of the Farnsworth system as installed in this particular mill is the pumping system. The whole of the condensate is collected in a drainage receiver where it is kept under a pressure of 25 pounds. When the receiver is full it automatically opens a valve in the live-steam line so as to force the condensate to the heater, which also operates at a pressure of 25 pounds. The receiver tank empties and fills on a full cycle, thereby metering the condensate, and a recording thermometer is provided which shows when the pump operates or stops. The whole system is completely closed and under pressure. Each machine has one duplex receiver and pump, with a capacity of 400 pounds of condensate per minute, each half of the machine being sufficient to carry the whole load in case anything should happen to the other half. There are also a number of small simplex pumps on various heating units throughout the mill, and as these systems also are completely closed and under pressure, it has eliminated all heating system traps.

A Ross ventilating system delivers warm air under the machine draws it up around the dryers so as to carry off the water evaporated from the sheet, and passes it through Briner economizers in which the heat of the outgoing vapor-laden air is used to warm up air taken from outside and delivered under the machine and to the roof. A special insulated hood, fabricated and erected by Wm. Hamilton Ltd., over the machine prevents the vapor-laden air around the dryers from escaping into the room, so that the extremely uncomfortable and dangerous conditions which were the rule in this part of a paper mill a few years ago are completely done away with.

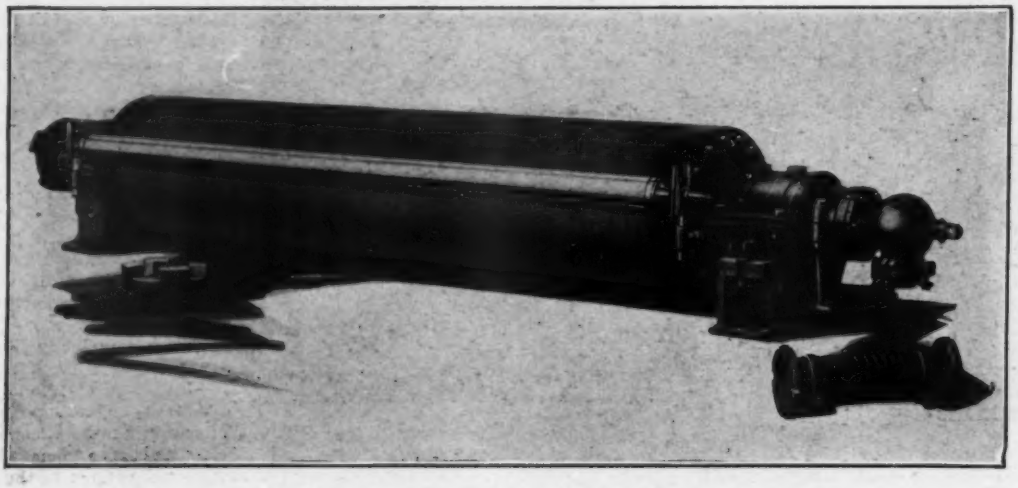
The Harland interlock sectional electric drive ensures very fine adjustment of the speed of the various sections within very wide limits, and keeps their relative speeds absolutely constant, so that the sheet cannot break through variations in the draw between succeeding sections.



The tower which houses the 125,000-gallon water tank and the Jenssen acid towers at the Anglo-Canadian Pulp & Paper Mills, Ltd.

Kilberry Suction Rolls

PATENTED



Illustrating Standard Couch Roll

For Couch and Press

Shell: Samson Bronze or Standard Gunmetal.

Shell Journals: Hollow Cast Steel secured to ends of Shell.

Bearings: Self aligning, ring oiling. Front side bearing with removable foot so that wire changes can be made without removing bearings from journal.

Suction Box: Concentric, easily adjusted and removed.

Drive: Direct (Patented).

NOW BEING MADE IN CANADA BY

Charles Walmsley & Co. (CANADA) LIMITED

WORKS: LONGUEUIL, QUE.

OFFICE: MONTREAL, QUE.

The broke is repulped in two large Shartle breaker beaters with 50-foot troughs, passed through a Port Arthur Shipbuilding Company mammoth junior jordan engine and returned to the main stream of stock going to the machines at a point intermediate the stock-metering system and the machine screens. The beaters are located in the machine room basement, transversely to the length of the paper machines and under the dry ends, so that all the dry broke is delivered directly into the beater troughs without any handling. Two of the machines have Walmsley winders and the other two have Cameron winders designed to operate at 3000 feet per minute.

As already mentioned, another interesting feature of this remarkable mill is the absence of a finishing room. Directly behind the winder is a roll-wrapping machine and a heading machine with steam-heated heads to dry the glue, from which the wrapped rolls are delivered directly to a "delevator" which discharges them into the shipping room, on the same level as the machine room basement, where they are handled by Ellwell-Parker electric trucks.

Aerial view of the Ste. Anne Paper Company's plant at Beaupre, Quebec

Power for Anglo-Canadian

The power to run the mill, about 36,000 horsepower, is obtained from the Duke-Price Company's 540,000-horsepower hydro-electric plant at Ile Maligne, 140 miles away, where Lake St. John discharges into the Saguenay River. It is brought in by a double transmission line carried on steel towers and delivered to the Anglo-Canadian substation at 165,000 volts. It is stepped down to 6600 volts through two banks of transformers of a capacity of 45,000 horsepower each, so that either of them has ample capacity to carry the full load of the mill. They receive their power from the main lines passing through a new design of porcelain oil-filled wall bushings and Canadian Westinghouse oil circuit-breakers designed to have a rupturing capacity of 300,000 volts, the highest of any installation in the world, and equalled only at the plant of the Southern California Edison Company. This 6600-volt power is delivered to a double set of bus bars and used directly in a 6000-horsepower Canadian General Electric steam generator and also on ten 2600-horsepower Westinghouse motors, each of which drives a line of two grinders. From the 6600-volt bus bar, twelve other transformers of various capacities step down the power to 2200 volts and 550 volts, which is used for the numerous other motors. Altogether there are over 450 motors in the mill, ranging in capacity from one to 900 horsepower, and all motors of more than 50 horsepower are run on a voltage of 2200.

Practically every piece of electrical equipment in the mill can be controlled on the panel board of the substation. Moreover, with the major equipment, means are provided for locking the circuit so that it cannot inadvertently be closed in case someone were working on it. In addition there is an elaborate and exceedingly sensitive system of relay protection whereby a minor trouble occurring on any circuit instantly opens the circuit before any considerable damage is done, thus giving the greatest possible protection both to the equipment and to the men in the mill.

Anglo-Canadian Boiler Plant

The boiler plant houses three (with room for a fourth) Babcock and Wilcox 1250-horsepower boilers, with air preheaters, water walls, Taylor stokers and Allen-Sherman-Hoff hydraulic ash removers. Coal from the cars is elevated to the coal crusher by means of a skip-hoist and is sent to the overhead bunkers which have a capacity of 300 tons. It is delivered from the bunkers to the furnaces by means of a weighing lorry, which automatically weighs and integrates the amount delivered to each boiler. The boilers are operated at 325 per cent of their rating, and generate steam at a pressure of 400 pounds per square inch, which incidentally, is the highest working pressure in any boiler plant in Canada.

The steam is expanded in a back-pressure Westinghouse turbine driving a 10,000-horsepower electric generator, the exhaust steam being used to dry the paper. The generator is so arranged that, in case of trouble on, or shut down of, the transmission line, it automatically furnishes power to the paper machines, thus reducing the danger of interruption of the paper production.

The water supply, 14,400,000 gallons per day, is taken care of by three vertical-direct-connected Cameron pumps of the Canadian Ingersoll-Rand Co., housed in a separate pump-house. The penstock bringing the water to the pump-house passes through the face of the mill wharf, and the water,

The Only

ROLLER BEARING BARKING DRUM

(Patented)

This 12 ft. x 45 ft. Drum is in operation at the Anglo-Canadian Pulp and Paper Mills Ltd., Quebec.

The above installation is among the many items of equipment supplied by William Hamilton Limited to the new Anglo-Canadian plant.

A recent report on this type of William Hamilton 12 ft. x 45 ft. drum operating in a tank shows 70 horse power at 30 cords per hour.

The astonishingly low power consumption at this rate of output is due to rigid construction and roller bearings supporting the entire drum and drive shaft.

Tires, gears and bracer rings are cast in one piece giving a perfect circle for smooth rolling.

This consistently uniform turning action not only gives great life to the drum but has reduced brooming to a negligible factor.

Equipment supplied to Anglo-Canadian plant at Quebec,—

Barking Drum,
Calendar Roll Truck,
All Inside and Outside-Conveyors.
Complete agitator equipment,
Structural Steel and
Complete erection of Four Paper Machine Hoods.

The above illustration shows a William Hamilton 12' x 45' Barking Drum under erection. Note the solid cast-steel "dome" end. No plate work on entire drum.

WILLIAM HAMILTON LIMITED

Peterborough, Ontario

WINNIPEG
Kipp-Kelly Limited

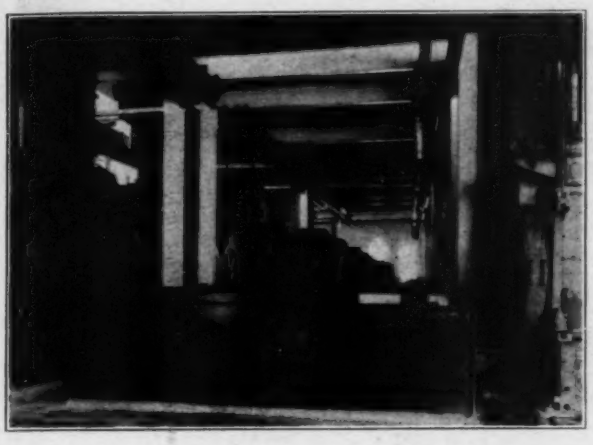
MONTREAL
Canada Cement Building

VANCOUVER
General Machinery and Heating Supplies Ltd.

before passing to the mill distributing system, is filtered in a battery of eighteen Norwood filters.

Welfare Provisions for Employees

No description of this mill would be complete without a word about the hospital. And when we say "hospital" we do not mean merely a first-aid station. The mill can boast of a completely equipped two-bed hospital with dispensary, room for diathermic treatment, X-ray room, dark room, operating room and laboratory where blood tests, urine analysis, etc., can be carried out. A doctor and a nurse are attached to this hospital.



Grinder room at the Ste. Anne Paper Mill

This shows the attention given to the welfare of the workers, and further evidence can be seen throughout the mill. Engineering and sanitation have been called upon to enable the men to work in perfect comfort and safety. A very complete system of overhead cranes and hoists eliminates all manual handling of heavy loads. Line shafting and belt drives are very conspicuous by their absence, practically all machines being direct-connected to the motors or driven through reducing worm gears, and the few belts which are used are very short. The whole mill is exceptionally well lighted, and on a bright day, such as the one on which the writer visited it, the mill is flooded with sunlight. In spite of the extremely compact arrangement of the machinery and equipment, which certainly makes this one of the smallest, if not the smallest, mill in proportion to its capacity to be found anywhere, there is no impression of crowding or cramping, and there is plenty of room to get around every piece of machinery. Moreover, a roomy, well-lighted locker room, provided with steel lockers, baths and hot and cold showers, still further adds to the comfort of the employees.

The Ste. Anne Paper Company

AT THE typical little French-Canadian village of Beaupré, situated at the confluence of the St. Lawrence and Ste. Anne rivers, twenty miles below Quebec, is the plant of the Ste. Anne Paper Company, Limited, another wonderful monument erected to modern industry by the genius of present-day paper mill engineers. The company was organized by persons associated with the Spanish River and Abitibi interests, and was included in the recently-consummated merger of these interests. It is therefore a unit of the largest Canadian newsprint producer. Its private siding is connected to the Murray Bay division of the Canadian National Railways, and the mill is splendidly situated for either rail or water shipment.

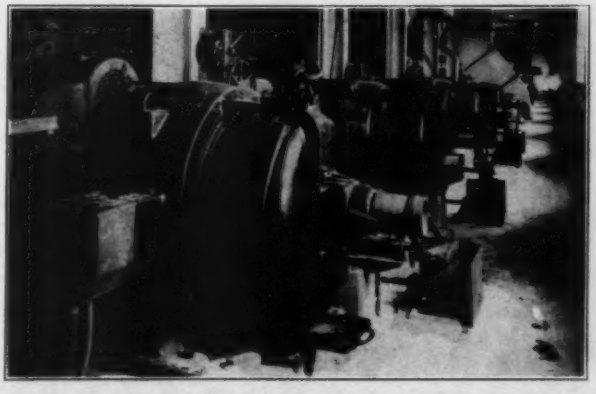
The wood is drawn partly from the company's own limits on the Ste. Anne River watershed and partly from limits on the Murray River leased from the Donohue brothers. It reaches the mill by rail, in four-foot lengths, and is unloaded into a water-filled trough, about 200 feet long by 12 wide, in which the water is circulated by a large centrifugal pump to deliver the wood to the foot of the log haul. After passing through a large Paulson drum barker, it is conveyed partly to the magazine grinder charging floor and partly to two 88-inch Waterous chippers. The chips first pass through a chip crusher, which breaks down the oversize chips without affecting those which are of the proper size; they are then screened on a pair of new style Ingersoll-Rand screens and the rejects are put through a Mitts and Merrill hog, which makes a most efficient rechipper. The good chips are blown on to an elevating conveyor which discharges them into the storage bin over the digesters.

The sulphur is burned in two Port Arthur Shipbuilding Company rotary burners, the feed hoppers of which are placed directly over and straddling the burners, so that the sulphur is melted by waste heat from the burners. The latter are on the same level as, and in close proximity to, the digester operating floor, so that the cook can attend to making his own acid, thus effecting perfect sychronism of the acid plant and digester house operations. In order to ensure the utmost safety in operating the digesters, the digester blow valves are opened and closed from a point entirely outside the building by means of a hand wheel at the end of a long rod. After having been washed in the blow-pits, the sulphite stock is screened in three Bird centrifugal pulp screens, which discharge the stock directly into the vats of the ten-disk American filter used as concentrator. At the present time only five disks are required, the holes in the hollow shaft for the remaining five disks being blanked off; but they can readily be added as required when the production of the mill is increased.

Ste. Anne Grinder Room

The grinder room houses ten of the latest type of caterpillar magazine grinders, made by the Continuous Wood Grinder Co., and embodying the best features of the Warren and the Voith magazine grinders. They are driven in pairs by five 2600-horsepower, 2200-volt Westinghouse sychronous motors. The grinders can easily each turn out 20, and even 22, tons of pulp per day; but at the present time they are being operated to turn out 17 tons per day, as the stock made under these conditions gives a better sheet on high-speed paper machines. Eight of the grinders have 54 by 62-inch sand stones, and the other two have 54 by 67-inch Norton stones. Since the mill started up last June, not a single stone has been broken, a feat of which the grinder-room crew are justly proud.

After passing through the bull screens, the stock is passed through six Bird screens and four American filters, as in the case of the sulphite, the groundwood and sulphite screens



Harland drive, wet end of machine at Ste. Anne Paper Mill

being all placed in a line, just back of and at a somewhat lower level than the American filters, into the vats of which they deliver the stock directly by centrifugal force.

The stock from the filter chests passes through two Trimbey consistency regulators, one each for the groundwood and sulphite, to the Trimbey metering and proportioning system, and thence to the Bird screens, of which there are three for each machine. In this mill, also, as in the Anglo-Canadian mill, the machine chests are conspicuous by their absence.

The grinder room is ventilated by means of a complete

Wet End of
TWO 234" NEWSPRINT MACHINES
For STE. ANNE PAPER CO. LTD.

Illustration shows removable Fourdrinier arrangement; Small bearing Millspaugh Suction Couch Roll; First and Second Millspaugh Suction Press Rolls.

These machines are designed to run at 1400 feet and are now in operation.

Built by

DOMINION ENGINEERING WORKS
LIMITED
MONTREAL · CANADA

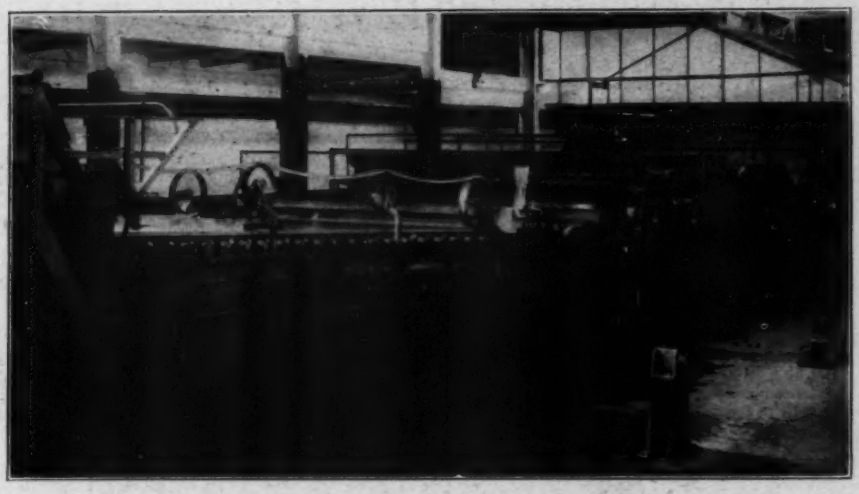
P. 37

Ross system which takes care of both this room and the charging room.

Paper Machines with Unique Drives

In the machine room there are two Dominion Engineering 234-inch machines, designed to operate at 1400 feet per minute and equipped with the most modern devices: Van de Carr slices, Beloit type of removable fourdrinier, suction couch roll, suction first and second presses, straight third press, forty-six 60-inch dryer cylinders, Sheahan rope carrier, English type reel, and Harland interlock sectional electric drive. This room is provided with a Ross ventilating system complete with Briner economizers for the utilization of the waste heat for warming up the fresh air.

The most interesting feature of the whole mill is undoubtedly the machine drive. At the wet end there are motors for the couch roll and each of the presses, and at the dry end there is one motor for the calenders and one for the reel. The dryer rolls are driven in pairs by twenty-three 18-horsepower direct-current motors, which all draw their power from the same busses but which are not tied into the other motors. The first dryer motor is interlocked according to the Harland system with the wet-end motors, while the last dryer motor is similarly interlocked with the calender and reel motors. The dryer felts act as the real synchronizers between the dryer rolls; as it cannot be determined if the top and bottom felts act the same, some mechanical tie is required between the two, and this is provided by driving one top and one bottom roll from each motor. The experience with this drive has been that there are no tight draws in the dryer section and that it causes but little shrinkage in width of the sheet, resulting in greater width of the sheet as reeled and also in longer felt life. A further advantage of this type of drive is that high paper machine speeds may be attained with low rim speeds in the gears, while the fact that the latter are totally enclosed and run immersed in oil reduces the power consumption. The drive has proved so satisfactory that it is hardly likely the mill will retain very long the distinction of being the only one equipped therewith. This dryer drive is patented in United States and Canada.



Wet end of No. 1 paper machine in the Ste. Anne Paper Mill

Part of the paper machine dryer drive showing one of the motors and totally enclosed gears at Ste. Anne Paper Mill

A Wm. Hamilton, 28 ton, roller truck is provided for handling calender rolls.

The Ste. Anne Boiler Plant

The boiler house contains three 800-horsepower Kidwell boilers operating at about 275 per cent of rating. They are fired with pulverized coal, each boiler being provided with an individual Raymond pulverizer. The steam is expanded in two 1750-horsepower back-pressure turbines, which are run so as to supply just the amount of exhaust steam required by the paper dryers. Each turbine drives a 650-kilowatt direct-current generator and a 900-kilowatt alternating-current generator, the latter being connected so that it can be run as a synchronous motor if required. This power, which is obtained at negligible cost as a by-product of the drying steam, reduces the amount of purchased electric power, which is obtained from the Duke-Price plant at Ile Maligne and is delivered to the mill substation at 60,000 volts. Approximately 16,000 horsepower are required to operate the mill.

The mill, with the two machines at present installed, has a rated capacity of 250 tons of standard newsprint per 24 hours. The plans, however, were drawn up with a view to ultimately doubling the capacity of the mill by installing two more machines, together with the necessary grinders, digesters, and auxiliary equipment; and when the time comes this can be done at a relatively low cost for additional construction.

In closing, the writer wishes to acknowledge the kindness and courtesy shown by the management of both the Anglo-Canadian and Ste. Anne mills in furnishing a highly competent and obliging guide, who took him into every nook and corner and who satisfied his curiosity by answering his innumerable questions.

Following is a list of additional equipment in the Anglo-Canadian Pulp and Paper Mills, Ltd., and the Ste. Anne Paper Co., Ltd., with names of the manufacturers who supplied same for these mills described in the foregoing story:

ANGLO-CANADIAN PULP AND PAPER MILLS LIMITED

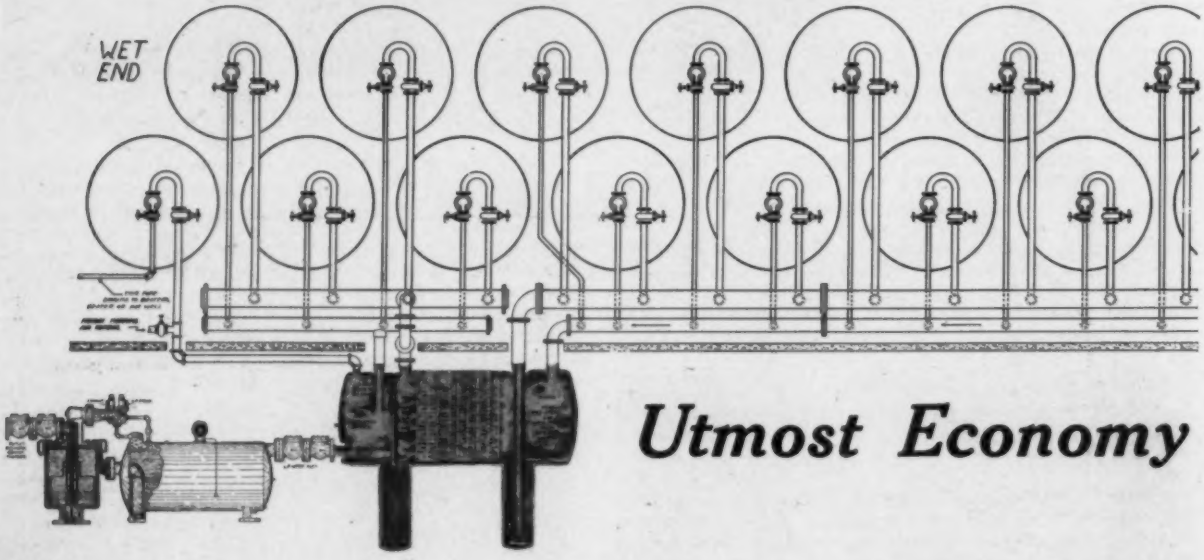
Agitators
Wm. Hamilton, Limited
Air Compressors
Canadian Ingersoll-Rand Co.
Ball Bearings
Chas. E. Walmsley & Co.
Bull Screens
Hydraulic Machinery Co.
Calender Roll Truck (28 tons)
Wm. Hamilton, Limited
Coal Handling Equipment
Affiliated Engineering Co.
R. H. Beaumont Co.

ASK US FOR

Our New 92-Page Catalog Telling How to

SAVE FUEL AND INCREASE PRODUCTION

THIS IS ONE OF THE MANY SYSTEMS SHOWN



Utmost Economy

Every Dryer as hot as dry steam will make it.
Every pound of water pumped at the Temperature of Steam.

This system will dry more and better paper with less steam. It will drain and pump the condensate at the temperature of steam and will meter accurately as well as record the high temperature condensate. Further, it will show accurately when each break occurred on the paper machine and how long the machine was down each time.

FARNSWORTH COMPANY

Heat Reclamation Engineers

CONSHOHOCKEN, PENNA.

Conveyors
Wm. Hamilton, Limited
Link-Belt Co.
Cooking and Recovery Equipment
Canadian Stebbins Engr. & Mfg. Co., Ltd.
Cranes
Northern Crane Works
Digesters
Horton Steel Works, Limited
Drum and Conveyor Equipment
Wm. Hamilton Limited
Electric Motors
Canadian Westinghouse Co.
Electric Trucks (Elwell Parker)
Industrial Equipment
Furnaces
Affiliated Engineering Co.
Grinder Stones
Lombard & Co.
International Pulpstone Co.
Cawood Co.
Jordan Engine
Port Arthur Shipbuilding Co.
Knotters
Paper Machinery, Ltd.
Sherbrooke Machinery Co.
Mechanical Pulp Diggers
Paper Machinery Co.
Oil Systems
S. F. Bowser Co.
Paper Machine Hoods
Wm. Hamilton, Limited
Pulp Separator
Paper Machinery, Ltd.
Roller Bearings
Timken Co.
Roll Grinder
Farrell-Birmingham Co.
Steam Turbine
Canadian Westinghouse Co.
Stokers (Taylor)
Affiliated Engineering Co.
American Engineering Co.
Sulphite Digester Linings
Canadian Stebbins Engineering Co.
Vacuum Pumps
Nash Engineering Co.
Mill Architect
Geo. F. Hardy

STE. ANNE PAPER COMPANY, LIMITED

Acid Plant
G. D. Jenssen Co.
Acid Storage Tanks
Pacific Coast Pipe Co.
Air Compressor
Canadian Ingersoll-Rand Co.
Ball Bearings
S. K. F. Industries, Inc.
Blow Pits
Pacific Coast Pipe Co.
Bull Screens
Hydraulic Machinery Co.
Calender Roll Truck (28 tons)
Wm. Hamilton, Limited
Coal Handling Equipment
R. H. Beaumont Co.
Conveyors
Webster-Inglis, Ltd.
Cranes
Dominion Bridge Co., Ltd.
Herbert Morris Crane & Hoist Co.
Electric Boiler
Dominion Engineering Works
Grinder Stones
Lombard & Co., Inc.
Log Haul-Up
Webster-Inglis, Ltd.
Meters & Gauges
Foxboro Co.
Bailey Meter Co.
Oiling System
S. F. Bowser Co.
Paint
Sherwin-Williams Co.
Paper Machine Hood
Canadian Johns-Manville Co.
Pulverized Fuel Equipment
Combustion Engineering Corp.
Rewinders
Cameron Machine Co.
Roller Bearings
Timken Co.
S. K. F. Industries, Inc.
Steam Distributing System for Paper Machine Dryers
No. 1 Machine—Farnsworth Co.
No. 2 Machine—Healy-Ruff Co.
Sulphur Burners
Port Arthur Shipbuilding Co.
Sulphite Digester Linings
Stebbins Engineering Co.
Sulphite Digesters
Dominion Bridge Co.
Vacuum Pumps
Nash Engineering Co.
Mill Architect
Geo. F. Hardy

Tariff on Paper Reduced

The budget brought down on February 16th by Hon. James A. Robb, Finance Minister in the Dominion Government, contains the following important modification in the duty on some important grades of paper: "Newsprint paper, machine finished book grades of paper, not coated, coated or supercalendered book grades of paper, when imported under items 197, 197a or 198a, when used exclusively in the production in Canada of magazines or periodicals, including farm journals, published and issued at regular intervals and enjoying second-class postal privileges, containing critical, informative and descriptive articles on various subjects, current topics, political and other news or reviews, criticism or other informative matter, or fiction, being bound, wire-stitched or otherwise fastened together subject to a drawback of 80 per cent of the duty payable."

This reduces the duty payable on all grades of paper entering into the production of magazines, periodicals, etc., to 5 per cent, or, in the case of coated paper, to 7 per cent, under the general tariff, and to 2½ and 3½ per cent, respectively, under the British preferential tariff.

This reduction came somewhat as a surprise in view of the fact that the application for reduction made last December to the Tariff Advisory Board by the Grain Growers' Guide, Winnipeg, and by the Canadian National Newspaper and Periodical Ass'n, had been strongly opposed by a number of organizations, including the Canadian Business Publishers' Ass'n. who claimed that the applicants could improve their business by adopting more modern business methods and equipment.

The Book and Writing Section of the Canadian Pulp and Paper Ass'n held a meeting to discuss the matter, which is likely to seriously threaten this branch of the Canadian paper industry.

Newfoundland International Co. Bond Issue

International Power and Paper Co. of Newfoundland, Ltd., a subsidiary of International Paper Co., in connection with the purchase of the properties of the Newfoundland Power and Paper Co., Ltd., has sold an issue of $4,866,000 first mortgage five per cent gold bonds due in 1968, to a banking group which offered it to the public simultaneously in Canada and the United States early last month. The issue is followed by mortgage debenture stock of a principal amount equivalent to $19,466,000, or four times the principal amount of the first mortgage bonds. The position of the first mortgage bonds is further strengthened by the fact that one of the issues of debenture stock is guaranteed as to principal and interest by by the British Treasury and the other by the Government of Newfoundland. In addition to these securities, which go to make up the equity for the first mortgage bonds, there is a pounds sterling issue of 5 per cent preference shares, amounting to the equivalent of $10,122,320, and a pounds sterling issue of common shares amounting to the equivalent of $2,433,250. All of the common is owned by the International Paper Co.

Through this, its most recent acquisition and its initial undertaking in the paper and power field in Newfoundland, International Paper has increased its total capacity to about 4,220 tons of various classes of pulp and paper per day, and its water powers in operation or under construction to an aggregate of about 800,000 horsepower.

In January 1928, Canadian newsprint mills operating at 88 per cent of rated capacity turned out 186,271 tons of paper, an increase of 15 per cent over the January 1927 production. United States mills, on the other hand, running at 80.7 per cent of rated capacity turned out 119,525 tons of newsprint in January 1928, a decrease of 12 per cent as compared with the same month last year.

American Filters in the Anglo-Canadian Mill.

AMERICAN PULP TYPE FILTERS

CONTROL THE DECKERING AND SAVEALL WORK IN THESE TWO REPRESENTATIVE MILLS.

Anglo-Canadian Pulp & Paper Mills, Ltd.

In this new mill, nine American Filters take care of all the

groundwood deckering
sulphite deckering
saveall work

As this mill when built had no other deckering or saveall equipment, the flowsheet was, in a sense, tied around these American Filters

Ste. Anne Paper Company, Ltd.

In the Ste. Anne Mill, five Americans do similar work. Here, too, as at Anglo-Canadian, American Filters are performing work highly essential to mill efficiency.

Mill control is simplified and fiber losses are prevented. These two mills offer a suggestion well worth any mill's consideration.

UNITED FILTERS CORPORATION

Main Office and Laboratory, Hazleton, Pa.

New York Chicago Salt Lake City Los Angeles

Export Office—25 Broadway, New York City Code Address—Unifilter, New York

Canadian News

QUEBEC

More Power Sites and Plants for I. P. Co.

Negotiations have been completed whereby the Canadian Hydro-Electric Corp., a subsidiary of International Paper, took over the common stock of the Ottawa and Hull Power Co., Ltd., and the minority shares of the Ottawa River Power Co., Ltd. Two power plants are involved in the transfer; one located at Bryson, Que., and the other at the Chaudière Falls, Hull. The combined capacity is 60,000 h. p., and an additional 100,000 h. p. can be developed at these two sites.

The final ratification of the deal is subject to acceptance by the shareholders, who have been requested by the board of directors to deposit their shares, with letter of acceptance, on or before March 15th. The price for the Ottawa and Hull Power Co. is $60 per share, and for the Ottawa River Power Co. $40 per share.

Proposed for Power Development

By far the largest project for the development of hydro-electric energy yet put forward in Canada has been submitted to the Dominion Government and to the Government of Quebec by a syndicate in which Frank P. Jones, former president of the Canada Cement Co., is one of the leading figures. The project is sponsored by the Beauharnois Light, Heat and Power Co., of which R. O. Sweezey is president. The project is to utilize the whole flow of the St. Lawrence River in the drop which that river takes of 83 feet from Lake St. Francis to Lake St. Louis, a few miles above Montreal. It is estimated that 2,000,000 horsepower could be developed here.

A feature of the proposal is to divert the flow of water from the present bed of the St. Lawrence into a canal to be built through what is now farming land. The canal would be 13 miles long, 27 feet deep, and not less than half a mile wide. It would form an important link in the proposed St. Lawrence deep waterway from Montreal to the Great Lakes, and the proposal is to provide this canal and present it as a free gift to the country in return for permission to develop the power.

At first only 500,000 h. p. would be developed, more being brought into use as the demand arose. Mr. Jones is now in England, and is understood to have completed provisional contracts with English concerns, to establish industrial plants here that would utilize practically all the initial 500,000 h. p. which it is proposed to develop. The cost of power developed by the first unit would be about $11.50 per horsepower, while for the subsequent units it would probably be reduced to around $9.00.

Two Minton Dryers for Riverbend Mill

Price Brothers and Co. have specified that the two 234-inch machines which they have ordered for their Riverbend mill are to be equipped with Minton vacuum dryers. The machines, which are being designed and constructed to operate at 1200 feet per minute, will each be equipped with twenty-two drying cylinders, instead of forty-six as generally used with atmospheric drying on high speed machines. Mr. Minton will personally supervise the construction and installation of the dryers for these two machines, which are expected to be ready to start up late in the summer or early in the fall of this year.

About fifteen months ago Price Bros. installed a vacuum dryer in one of the 156-inch machines in their Kenogami mill. They have subjected it to very thorough and severe operating tests, and their satisfaction at the results is best shown by the order for two more on their new machines.

Wayagamack Issues Additional Stock

Wayagamack Pulp and Paper Co. has decided to issue 33,333 new shares of no-par-value common stock, which will be offered at $60 per share to shareholders of record March 16th, on the basis of one share for every three shares held. Part of the money thus obtained will be used to retire $1,500,000 of short term bonds coming due in January 1930, and the remainder will increase the company's working capital by about half a million dollars.

At the annual meeting of the company, which was held at Three-Rivers on February 14th, the following were elected directors: Norman J. Dawes, G. H. Duggan, Hugh Mackay, K. C., Alexander Maclaren, Jas. W. Pyke, J. Frater Taylor and C. R. Whitehead. At the subsequent meeting of the directors, C. R. Whitehead was elected president, and Jas. W. Pyke vice-president.

A further extensive housing development is to be made this year at Gatineau by the Gatineau Development Co., a subsidiary of Canadian International Paper Co. James Murray, general manager of the big pulp and paper mills at Gatineau, is vice-president of the subsidiary company. Last year twenty-five houses were erected by the company, sixteen of which have been sold to the employees of Canadian International Paper. Another twenty-five houses will likely be put up this year.

The annual report of the Duke-Price Co. for the year ended December 31st, 1927, shows operating revenue of $3,123,526, up from $1,113,634 in 1926 and $188,671 in 1925, in the course of which year the plant was started up in the month of May. In considering these income figures, it should be remembered that the capacity of the plant has been materially increased, being now 540,000 h. p. and that earnings for the future should be largely augmented by the increased electrical output of the plant and by the power contracts they now have on hand.

In the course of a twelve-minute conversation between Henry J. Wiser, president of International Fibre Board, Ltd., manufacturers of building insulating board, from the new mill of the company at Gatineau, Que., with Gilbert H. Norris, president of Ten-Test Fibre Board Co., Ltd., at Bristol, England, a contract was closed for over 200 carloads of ten-test insulating board for English consumption, to be made in the company's mills at Gatineau, Que., and Midland, Ont., delivery to start immediately.

Val Jalbert Mill to Be Dismantled

The Quebec Pulp and Paper Corp., which was organized to take over the Quebec Pulp and Paper Mills as a going concern when control of the latter was acquired jointly by the Port Alfred Pulp and Paper Corp. and by Price Bros., has decided to dismantle its 125-ton groundwood mill at Val Jalbert, which has been shut down since the 15th of August last.

This will permanently throw out of work over 200 men, many of whom are heads of large families. The company owns a large number of houses in the village, of which the mill was the only important industry, and it has given notice to its tenants, about eighty in number, that they must vacate the premises. This will practically wipe what was, until recently, a prosperous community, and the company's decision is causing a great stir in the Lake St. John district.

Right Hon. L. C. M. S. Amery, British Secretary of State for the Dominions, in the course of his recent trip to Canada, visited the Gatineau mill of Canadian International Paper

The Pulp and Paper Industry in Canada Has Unsurpassed Engineering and Production Facilities at its Doors

The mills of the Anglo-Canadian Pulp and Paper Company and the Ste. Anne Pulp and Paper Company, are recent installations whose early operation has been facilitated by calling upon the experience and facilities of the Canadian Westinghouse Company.

THE first to build synchronous motors for pulp grinder drive, the Canadian Westinghouse Company also led the way in pioneering a majority of the real big Canadian projects and engineering undertakings such as Shawinigan, Laurentide, Duke Price, Queenston, the Chelsea and Paugan Developments of the International Paper Company, and a great many others.

Developments in Which We Specialize

Alternating Current Water Wheel Generators with Kingsbury Thrust Bearings.
Switching Equipment and Oil Circuit Breakers.
Water-Cooled and Self-Cooled Transformers.
Outdoor Sub-Stations.
Lightning Protective Devices.
Synchronous Pulp Grinder Motors and Automatic Motors and Control.
Motors and Control for Pumps, Jordans, Beaters, Bird Screens and Air Compressors.
Steam Turbine Generator Units.
Motors and Control for Paper Machines.
General Purpose Motors and Control.

Canadian Westinghouse Company

HAMILTON, ONTARIO

Everything Electrical for the Pulp and Paper Industry

Co. He had also planned to tour the three big hydro-electric power plants at Farmers Rapids, Chelsea and Paugan Falls, on the Gatineau River, but a heavy snowfall prevented the carrying out of this plan, and considerable difficulty was encountered even in motoring the short distance from Ottawa to the big newsprint mill, the motor cars being snowed in twice on the way.

Chahoon Heads Laurentide-St. Maurice Merger

The partnership idea behind the Laurentide-St. Maurice merger is carried out in the personnel of the board of directors of the new Canada Power and Paper Corporation. The board is as follows: chairman of the board, Sir Herbert S. Holt; president, Geo. Chahoon, Jr.; vice-president and managing director, George M. McKee. Directors: Sir Vincent Meredith, C. B. McNaught, Sir Lomer Gouin, Arthur Cross, J. W. McConnell, G. H. Montgomery, F. A. Sabbaton, W. E. Wilder, Edwin Hanson and J. H. Gundy. The new directorate represents a combination of the two strongest banking groups in Canada, supported by an operating organization that is probably unexcelled in the newsprint industry.

The acceptance by Mr. Chahoon of the presidency is a fitting recognition of his long service and splendid leadership in the Canadian newsprint industry and will be welcomed by the shareholders of the Laurentide Company, most of them of many years' standing.

To the vice-presidency, Mr. McKee brings a record of outstanding success in the development and operation of newsprint properties, and to him is largely due the splendid position occupied today by St. Maurice Valley Corporation.

The Harland Engineering Co. of Canada, Ltd., Montreal, has added a mechanical department to its organization dealing with power plant work and mechanical equipment. It is now in a position to give the fullest information on steam turbines, condensing plant, steam engines, Diesel and solid injection oil engines, helical reducing gears and worm gears, boiler feed pumps and general service pumps up to any head or quantity. A. D. Harrison, who has been placed in charge of this new department, returned to Canada two years ago. He received his training in England, but has had several years' experience in the United States.

Paper Machinery, Ltd., of Montreal, recently secured orders for four Kamyr wet machines and presses. One of these machines will be installed by the Brompton Pulp and Paper Co., one by the St. Maurice Valley Corp., and the other two in the new kraft mill to be built by the Union Bag and Paper Corp. at Tacoma.

Charles Boyd McNaught, president of Canada Paper Co. and of Kilgours Ltd., and a director of St. Maurice Valley Corp., has been elected president of the British Empire Steel Corp., which was acquired last month by Holt-Gundy and Co. of Montreal, and is being reorganized to put it on a paying basis.

At the annual meeting of the Quebec Forest Industries Ass'n, Ltd., held last month at the Ritz Carlton Hotel, Montreal, the election of officers resulted as follows: president, Geo. Chahoon, Jr.; first vice-president, Dan McLachlin; second vice-president, J. H. Price. These officers and the following constitute the association's governing council for 1928: J. B. White, W. R. Brown, C. R. Whitehead and J. B. Gilmour.

Quebec Sells Timber Areas

Three parcels of forestry area were disposed of last month by the Lands and Forest Department, at Quebec.

The Ontario Paper Co. bid a bonus of $1 per thousand feet, plus the usual stumpage dues of $2.27 per thousand feet, for a parcel of 170 square miles on the Rivière aux Rochers, which adjoins its present holdings at Shelter Bay. The company was the only bidder.

There was brisk fight for an area of 38 square miles on the Franquelin River, in the same district, the Champoux Lumber Co., of Quebec bidding against the Ontario Paper Co., with the result that the bonus price went to $2.50 per thousand feet. plus the stumpage dues.

Shepherd and Morse, a Boston concern which has long been established in the Gaspé Penninsula, paying $1 per thousand feet as bonus price, plus the stumpage dues.

The annual meeting of the St. Maurice Valley Branch of the Engineering Institute of Canada took place last month at the Laurentide Inn, Grand'-Mère. The meeting took the form of a dinner, the president, Ellwood Wilson, occupying the chair, with Frank Sabbaton, vice-president of the Laurentide Co. and Laurentide Power Co. J. R. Riddle, chief engineer of the Laurentide Power Co., give an interesting talk on power developments, and several other problems were dealt with.

The private bills committee of the Legislative Assembly, at Quebec put through with minor amendments the bill incorporating the town of Shipshaw. The name was changed to Racine in honor of the first bishop of that district. Racine is to be the model town at Chute à Caron, where an 800,000-h. p. hydro-electric development is under way.

ONTARIO

Abitibi Fibre Co. Asset of Abitibi Merger

In the various announcements dealing with the consolidation of Abitibi Power and Paper Co. and Spanish River Pulp and Paper Mills, and four other newsprint producers, little has been said of Abitibi Fibre Co. This organization, the successor of the Mattagami Pulp and Paper Co., was brought into the merger by Abitibi. It is not a newsprint mill like the rest of the merger group, but produces unbleached and bleached sulphite pulp. Recently several hundreds of thousands of dollars have been spent on the plant in order to enable it to operate to its entire capacity in the production of bleached sulphite pulp, if desired. As a result, this plant, when working to its complete capacity, can turn out 60,000 tons of high grade bleached sulphite per annum.

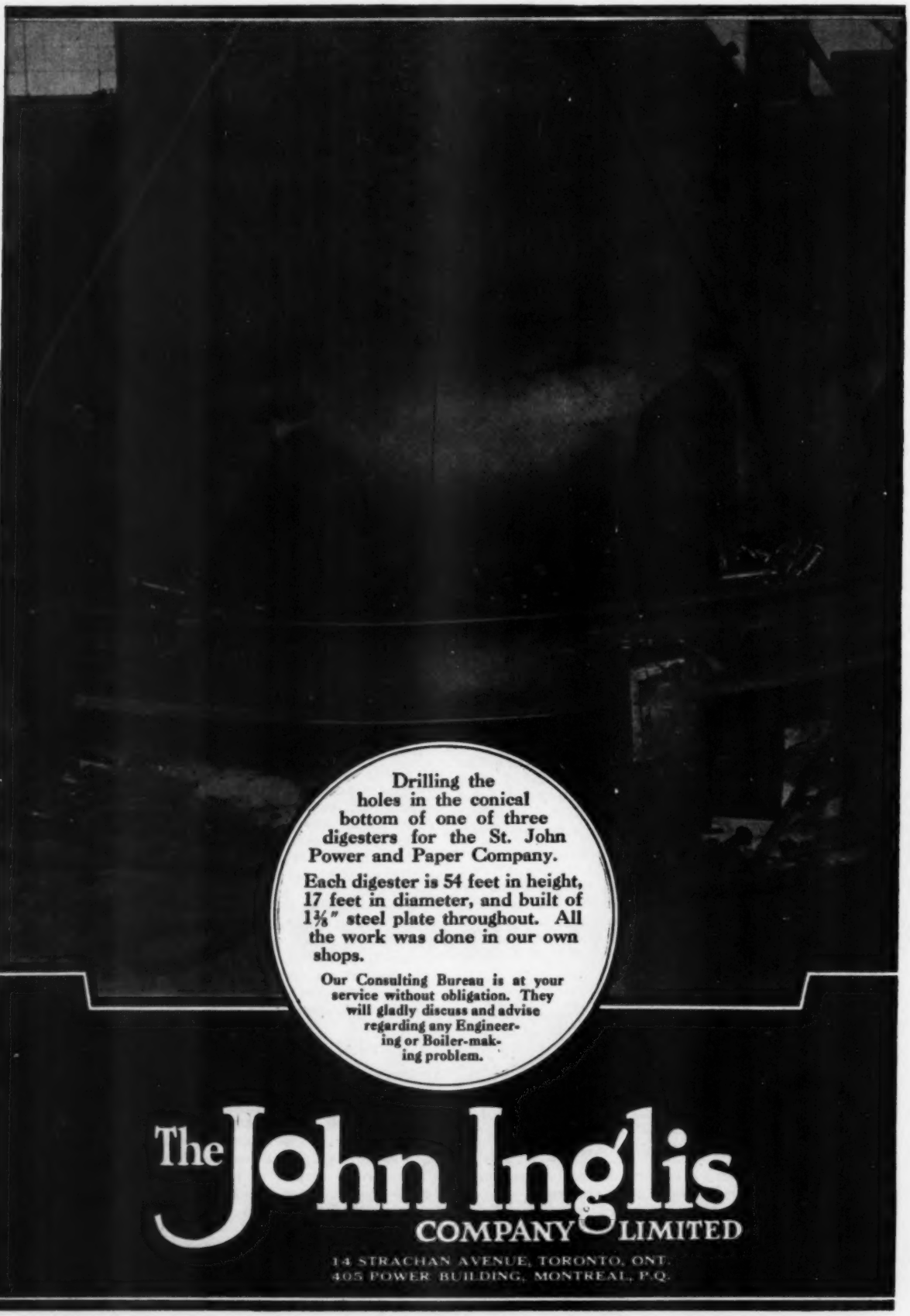
For some time past bleached sulphite has been more profitable than unbleached, as market conditions for the former have been much more favorable. Abitibi Fibre, through this expenditure, has been placed in a position to take the best advantage of current market conditions. It will be a matter of interest to learn that, in spite of the changes that were taking place in the plant, the mill has been able to operate at full capacity, since it was acquired by Abitibi Power and Paper Co.

Work is now proceeding on the changes necessary to enable the water in connection with the Fibre Company's power plant to be raised to a point that will give an additional twelve feet of head. This will enable sufficient power to be produced at the mill to cover its future requirements, the increase being necessary owing to the fact that production of bleached sulphite requires more power than that of unbleached.

F. N. Burt Company's Profits Increased

The F. N. Burt Co., Ltd., in the year ending December 31, 1927, had net profits, after deducting depreciation and amortization, amounting to $563,971, as compared with $500,188 for 1926. Of this amount, $67,000 was set aside to provide for federal taxes payable in 1928. Dividends for the year absorbed the sum of $325,488, leaving a balance of profits of $171,483. This, with a surplus of $687,279 brought forward from the previous year, gave a surplus of $858,763, to be carried forward to the new account.

President S. J. Moore, in his report to the shareholders, pointed out that the company's business in 1927 showed gains over 1926 in both the United States and Canada. After several years of small returns, the Canadian division has entered upon a period of excellent trade. The new section of the



Drilling the holes in the conical bottom of one of three digesters for the St. John Power and Paper Company.

Each digester is 54 feet in height, 17 feet in diameter, and built of 1⅛" steel plate throughout. All the work was done in our own shops.

Our Consulting Bureau is at your service without obligation. They will gladly discuss and advise regarding any Engineering or Boiler-making problem.

The John Inglis COMPANY LIMITED

14 STRACHAN AVENUE, TORONTO, ONT.
405 POWER BUILDING, MONTREAL, P.Q.

main factory in Buffalo was occupied in the early spring, and factory "C" was closed, but the company is now obtaining the expected benefits from this consolidation.

Premier Ferguson last month denied that the Ontario Government had given, or promised, a power site on the Montreal River to the Great Lakes Paper Co. The Premier added that he was investigating the whole matter, in order that he might know exactly what was the status of the Great Lakes Paper Co. on the Montreal River. He said that the only possible means by which the company could consider itself to have acquired power rights on the Montreal River was by purchase of river land from the Algoma Central Corp.; but no assignment of rights had ever been filed, and any claim to such rights would be opposed by the Government on the ground that it owned the beds of all its rivers.

Waterous, Ltd. Will Manufacture Barking Drum

Waterous, Ltd., pioneer builders of pulp mill machinery in Canada, have announced that they have completed arrangements whereby they have become interested with B. Branch in his barking drum. Mr. Branch, who is well known to the Canadian and American papermakers, has been applying his knowledge and experience in designing a drum of his own, for which patents have been granted. Waterous, Ltd. have acquired the exclusive manufacturing rights in Canada and Newfoundland, with Mr. Branch in charge of barking drum sales.

E. W. Backus, pulp and paper magnate, accompanied by A. D. George, solicitor, Fort Frances, were in conference last month with the Ontario Minister of Lands and Forests in Toronto, with a view to settlement of claims made by the Department against Mr. Backus as a result of the flooding of valuable timber lands in the Rainy River area, and also the burning of timber in connection with the establishment of a dam on the Seine River. The Minister reported headway with the negotiations, which were not completed, however. A considerable sum is involved in the claims.

Fred G. Hunt, who for seven years has occupied important positions with Kilgour Ltd., paper box manufacturers and dealers in wrappings and other paper lines, has severed his connection with that firm and has joined the sales staff of the Telfer Paper Box Co. The latter company is about to occupy a large new addition to its plant on Duncan St., Toronto.

The Minnesota Power Co., of Fort Frances, a Backus enterprise, has applied to the Ontario Legislature in a private bill for the renewal of a 1912 law which gave them the right to expropriate certain lands in Fort Frances for their use. The act of 1912 gave the company the right to expropriate eleven lots. All but two of these were acquired by purchase, but terms could not be reached concerning the other two. In the meantime, the expropriation rights expired. Petition to the Legislature recites that the land in question is essential to the industry. The municipality joined the power company in making the application.

The Rudd Paper Box Co., Ltd., Richmond St. West, Toronto, of which Victor E. Donaldson is head, has changed its name to Canada Cartons, Ltd.

John R. Booth, Ltd., of Ottawa, recently installed a new winder in the paper mill, which caused a slight letting up of operations. Normal operation has now been resumed.

Ontario Buys More Planes for Forest Protection

An order has been placed with the De Haviland Corp., of England, by the Lands and Forests Department, for two more additional sea-planes of the "Moth" type, to be used for the purpose of forest fire detection.

Four of these planes were introduced into the service last year by Capt. Roy Maxwell, in charge of the service, and to their operation is credited much of the good work done in the direction of fire detection last season, wastage through forest fires being known to have been much less in 1927, though final figures are not yet available. The new planes will probably be in service before midsummer.

At the respective annual shareholders' meetings, held last month, of the Victoria Paper and Twine Co., Ltd., the Garden City Paper Co., Ltd., and the Canadian Vegetable Parchment Co., Ltd., Leo E. Charles, managing director of all three companies, reported that, in the case of each company, the year 1927 had been very satisfactory, and expressed appreciation of the efforts of all concerned. S. W. Ewing, Montreal manager, was elected vice-president of the Victoria Paper and Twine Co., Ltd. The meeting of this organization was preceded this year by an interesting and pleasant feature, when the directors of the company, in a body, visited Montreal, where they were the guests of S. W. Ewing, the local manager.

John F. Ellis

John F. Ellis, president of Barber-Ellis, Ltd., of Toronto, Winnipeg and Vancouver, and one of the best known figures in Canadian paper circles, passed away at his home in Toronto on February 19 at the advanced age of 82. Though he had been in rather poor health for some time, his final illness was a brief one, and he was at his office until a couple of weeks before his death.

In 1876, in conjunction with the late John R. Barber, Mr. Ellis established the firm with which he was connected until the time of his death. Until eleven years ago he was managing director of the company, and since that time its president. He was one of the organizers and first president of the Canadian Paper Trade Ass'n. Since retiring from that position, he has been the Honorary President.

An application has been made by the Kenora Paper Mills, Kenora, for a charter to build a railway into Red Lake. The company is controlled by E. W. Backus, widely known pulp and paper magnate, who some months ago was reported to be looking over the ground with a possibility of building such a line. The application states that the railroad would be operated from a point near Kenora on the Canadian Pacific Railway by the most feasible route crossing the Canadian National Railway and the English River, thus traversing Mr. Backus' English River pulp wood limits, and thence to Red Lake mining area, Narrow Lake and Woman Lake in the district of Patricia.

The plant of the Nipigon Fiber Corp. at Nipigon, which was closed down some time ago, will, it is expected, be started up again shortly. The mill, which has a capacity of about 60 tons of groundwood daily, was lately acquired by the International Paper Co., a representative of which recently spent some time at the mill and visited a portion of the timber holdings of the company.

Paul Hass, superintendent of the Fort Frances Pulp and Paper Co., Fort Frances, has resigned to accept charge of the Howard Paper Co.'s mill at Oregon City, Ore. It is understood that his successor will be Mr. Rickenson, electrical engineer, who has been with the Fort Frances Co. for a number of years.

NEW BRUNSWICK

Canadian I. P. Co. to Operate Bathurst

Canadian International Paper Co., Ltd., has purchased a half interest in the Bathurst Co., from Nesbitt Thomson and Co., of Montreal, and will operate the reorganized property which was purchased some weeks ago by the financial house. The latter has made an offering of 400,000 shares of Class

RYTHER AND PRINGLE COMPANY
CARTHAGE N.Y.

RYTHER SLASHERS

RYTHER SLASHERS are built to carry from one to eight saws, depending upon the length of logs received and the desired pulpwood size. The frame is of structural steel throughout. The machine parts are extra heavy and designed for maximum capacities. Each slasher is a complete unit and can be introduced in any cutting up system.

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

"A" shares and 300,000 shares of Class "B" stock, half of which has been acquired by Canadian International Paper. It is stated that the proceeds of this offering will be used to redeem bonds presently outstanding and pay off bank loans. There will be no funded debt or preferred stock ahead of the Class "A" shares, which were offered with a bonus of Class "B".

Two injunctions affecting the transfer of stock of the Bathurst Co., Ltd., in connection with the recent purchase in which Nesbitt Thomson and Co. secured controlling interest, have been issued in the Chancery Court of New Brunswick. The injunctions have been issued on application of Sir James H. Dunn, at present in London, England, who during the summer months of the year usually resides in the vicinity of Bathurst. One injunction enjoins Angus Maclean, president of the Bathurst Company, from transferring certain shares in the company until a decision is reached on a claim of Sir James H. Dunn that he holds an option on those shares. The other injunction enjoins the Bathurst Co. from registering any transfer of shares until a decision is reached.

Sir James H. Dunn, accordng to the presentation before Sir Douglas Hazen, chief justice of the Province of New Brunswick, claims that he acquired 5000 shares in the Bathurst Co. from President Angus Maclean, and also received an option from him on 2000 other shares. The injunction concerns the shares claimed to be under option. A matter of some $100,000 is said to be involved, the value of the shares having risen from $50 about the time the option is said to have been given to $105 when the negotiations for the transfer were under way at Montreal.

It is stated that the new owners of the properties intend manufacturing kraft paper, the mill at present producing about 75 tons of kraft pulp a day, which is being sold to kraft paper manufacturers in Canada and the United States.

Paper Making Course in High School

A pulp and paper school has been opened at Edmundston in connection with the vocational work in the high school there. The first work of this nature in New Brunswick was started last year, when a course of twenty lectures was given by Leo Kelly, M. A., former chief chemist of Fraser Companies, Ltd., on paper production. Mr. Kelly is now superintendent of the sulphite mill at Edmundston.

This year, too, a class is starting on the three years' course laid down by the Canadian Pulp and Paper Ass'n. A modern laboratory has been installed in connection with the present school and is now nearing completion. Experts from the Fraser Companies and High School teachers will conduct the course; and now that a groundwood mill is being added, Edmundston will be able to cover fully all phases of pulp and paper manufacture in its new school course.

Fraser Companies Report Higher Earnings

The annual report of Fraser Companies, Ltd., for the year ended December 31st, 1927, contains information and figures which reflect the important developments that are taking place in the company's business at the present time. While the profit and loss account make satisfactory reading for shareholders, the balance sheet is of particular interest, showing as it does many pronounced changes from the figures presented at the end of 1926, and reflecting the considerable strides which Fraser is taking in the fine paper manufacturing field.

The profit and loss account for the year ended December 31st, 1927, shows earnings after operating expenses, federal and general taxes, and provision for bad and doubtful debts to have increased $111,129 over the previous year's figures. These earnings of course were entirely derived from the company's then existing productive capacity of approximately 20,000 tons sulphite paper, 42,000 tons bleached sulphite pulp and 18,000 tons unbleached sulphite, and do not reflect any portion of the increased earning power to be derived from the doubling of finished high grade sulphite pulp and paper production through new plant construction at present being carried out. After provision for interest on the increased amount of bonds outstanding, interest on the new debenture issue, depreciation and depletion write-offs and preferred and common dividends, the surplus for the year was $231,194, or $62,232 more than for 1926.

According to present indications, power from the Grand Falls development on the St. John River will be available in the summer.

NOVA SCOTIA

C. H. Wright, of Wolfville, is the contractor in charge of construction operations at Hantsport, N. S., for the Minas Basin Pulp and Paper Co., of which R. A. Jodrey is manager. This concern is sponsoring a small pulp mill at Hantsport, with probability of extension within a few years.

The Avon River Power Co., of Windsor, is installing an additional generator at its plant in Windsor. A survey has also been made of a proposed pipe line in the upper Avon River, and about a mile above the first dam and generating plant. This new pipe line will add 4350 h.p. to the existing capacity. The extensions are being made to furnish power for the new pulp mill now under construction by the Minas Basin Pulp and Paper Co., which is allied with the Avon River Power Co.

BRITISH COLUMBIA

Work on the big new breakwater at Powell River, the cost of which is being shared between the Powell River Co. and the Government, is progressing favorably. Two additional locomotives have arrived on the scene to assist in the work and great speed in construction is being shown.

Fred N. Sievers, who at one time was connected with the Crown-Willamette Co., at West Linn, Ore., has left the Pacific Mills, Ltd., Ocean Falls, to accept the duties of superintendent of the Sidney Roofing and Paper Co., Victoria.

The announcement of sale by auction in Montreal of the timber limits of the Fraser Timber Syndicate has had the effect of greatly reviving the hopes of the town of Prince George for a proposed pulp mill, in which Eastern Canadian capital has been said to have been interested. Plans for a mill in the Northern British Columbia town were first made public about a year ago. Since that time little information has been available.

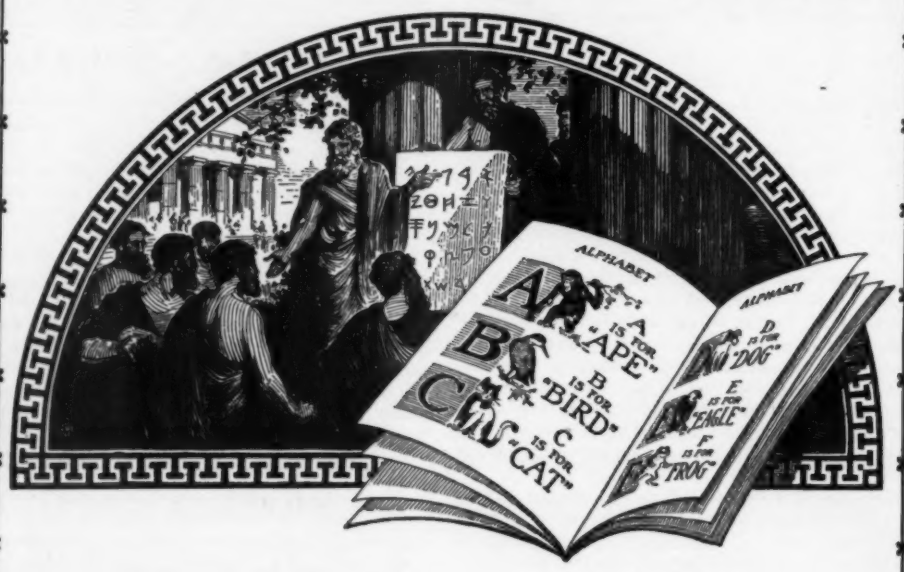
Early last month the docks at Powell River were exceptionally busy, with six boats loading newsprint for Australia, Buenos Aires, Seattle, and a number of other South American and United States points.

World's Greatest Paper Machine

A paper machine which will not only be the largest in the world, but which will also break all previous production records, is to be installed at the Fort William, Ontario, mill of the Backus-Brooks Company in Canada.

This machine, made by Bagley and Sewall, will be 304 inches in width, and will have a speed range of from 625 to 1500 feet per minute. It will be equipped with the General Electric regulator type drive, manufactured by the Canadian General Electric Company. Power will be supplied by a 1,000-kilowatt synchronous motor-generator set, also of Canadian General Electric manufacture.

The new machine will be the second to be installed at the new paper mill which is being added to the existing ground wood mill of the Backus-Brooks Company. The first machine, now being installed, is a 264-inch Bagley and Sewall machine, equipped with the same type of drive.



The A-B-C of Written History

EVERY child goes through the alphabet age. So did the human race in its childhood. Herodotus wrote of "Cadmus, the Trojan" who is credited with having introduced the Phoenician alphabet among the Greeks. The latter, having learned to make symbols represent sounds, would write their first line from right to left after the fashion of their Semitic teachers. Then the second line would run from left to right, and so the inscription would wind back and forth. Soon, however, Greek writing settled down to a left to right order.

The Greek characters were changed by the Romans, whose ideas of letter formation we have modified very little even to this day.

Cadmus, whether a real person or merely a name to represent Phoenician culture, deserves our thanks. For with the successor to his alphabet the thoughts and experiences of today go into more than one hundred languages—on millions of sheets of paper—and tomorrow spread their benefits before a new generation.

HAMMERMILL PAPER CO.

ERIE, PA.

The Month at Washington

IDENTICAL bills introduced in the House and Senate (H.R.11081 and S.3297), would amend the reforestation act concerning the protection of forest lands to permit the Secretary of Agriculture to assist forest industries and timberland owners in the management of forest lands and the utilization of their products with a view to promoting reforestation.

The bills to create a division of safety in the Bureau of Labor Statistics of the Department of Labor (H.R.6848 and S.1266) have been favorably acted upon by the Senate and the House and will become law. This division will collect statistics of industrial accidents in all lines of employment, study causes and their remedies, investigate labor safety plans and devices of various kinds and their needs and adaption to different classes of machinery, process of production, etc., study occupational hazards and their prevention, etc.

The chief purposes of this legislation are (1) to develop a more complete and more efficient method of collecting and analyzing statistics of accidents and occupational diseases in industry and on a national scale; (2) to disseminate this information and to encourage the application of such preventive measures as will reduce or eliminate industrial accidents and occupational diseases.

The House Committee on the Judiciary reported favorably on H. R. 8927 to amend the export trade promotion act of April 10, 1918, as legislation urgently needed for the protection and promotion of American trade, particularly concerning the import trade. This act, if it becomes a law, which is expected shortly, will permit without violation of the anti-trust law, the pooling or combination of interests for the importation of essential raw materials used in manufacture.

Several resolutions introduced recently would inquire into the serious and increasing state of unemployment (H. Res. 119) and to urge the speeding up of all public buildings to be constructed either by the federal government or the state governments; of similar import (S. Res. 147) is a Senate resolution; and H. Con. Res. 21 which because of the lack of uniformity and confusion and inequality in tax burdens, would require a scientific study of the subject by the Bureau of Standards at Washington while H. Res. 114 would adopt certain legislative measures and economic policies including tariff reduction and international trade agreements, looking toward the development of more liberal trade relations with broader and better foreign markets, and afford financial assistance and other aid and encouragement to agriculture.

The House passed the Vestal Bill (H. R. 6104) to provide for an increase in the copyright fee from $1 to $2, etc., and it is expected that this bill will soon be passed by the Senate and sent to the President for signature.

Extensive hearings have been held by the House Committee on Post Office and Post Roads on the bill to reduce postage rates (H. R. 9296) and on lower air mail rates (H. R. 8337), advocated strongly by business interests but the Post Office Department will only approve a flat pound rate for 3d class matter, one cent postal cards, and the proposed return card and envelope provisions in the bill. It does not accept a flat rate of 2½ cents per pound on books carried by the postal service. The National Council of Business Mail Users claimed that because of high postage rates in this country, British and Canadian business firms have an advantage in circularizing in direct competition with American business firms on catalogs and other direct mail matter. It is claimed that the American mails are not prohibitive in price for using the mails for circularizing advertising matter. It is also claimed that the restoration of the 1920 postage rates for newspapers and periodicals would enable publishers to increase their circulations. A reduction in rates it is also claimed would increase the volume of first class mail, because publishers with lower postage rates would utilize those mails to a greater extent. The Post Office Department should either go on a mass or on a class basis. It is pointed out that the rates on private mailing cards has driven more than 80 per cent of private post cards out of existence; that zone rates on advertising matter in newspapers and magazines which the Post Office Department claims yields substantial profits has in fact shown a decrease instead of an increase corresponding to the growth of the publication business, that the rates on newsdealers bundles used in wholesale newspaper and magazine distribution are too high for the service rendered; that rates on publications mailed other than the publishers are so high that this business shows a decrease of 37 per cent.

The House Committee on Post Offices and Post Roads reported favorably on a bill (H. R. 8337) to reduce the rate of 10c per ounce to 5c per ounce on air mail postage. "The present rate is too high to secure a large volume of business", said Congressman Kelly, author of the bill. "Many mail planes fly only partly loaded. Lower rates will substantially increase patronage".

Simultaneous with this, comes the announcement by the Post Office Department of the establishment of an air mail fee of 8c instead of 10c per half ounce in addition to the regular postage on articles mailed in the regular air mails to foreign countries.

The Senate and House Committees have practically agreed on the "lobby" bills (S.1095) and the registration of lobbyists will soon become a law and a new era be established in the halls of Congress which has been prevalent since the days of 1776. A lobbyist is defined as one who engages for pay to attempt to influence legislation or to prevent it in Congress, and he must register with the clerk of the House and the Secretary of the Senate and disclose his interest in the bill. The bill affects only the "shyster" and does not interfere with association activities whose headquarters are in Washington, etc.

Senator Schall in S.2862 would modify the time calendar now in general use in the U. S., to be known as the Liberty Calendar, now before the Judiciary Committee.

Federal Trade Rulings—Joint arrangements for fixed freight allowances and fixed terms of sale by 25 manufacturers of wall paper organized as an association, were discontinued by stipulation agreement with the Federal Trade Commission, and each company agreed hereafter to fix its own transportation allowances and terms of sale without consultation, discussion, agreement or understanding with other members of the association or any other manufacturers of wall paper. It was also agreed to withdraw from circulation a set of "trade regulations" drawn up for the benefit of the members of the association.

Recent Customs Decisions—Paper classified at 3c per pound and 15 per cent ad valorem as writing paper under par. 1307 was claimed dutiable as printing paper at one-fourth of 1c per pound plus 10 per cent ad valorem under par. 1301. The U. S. Customs Court sustained the protest of the importer (Wm. Hartmann & Co., 120456-G.)

Merchandise classified as printing paper with a surface design classified at 4½c per pound plus 17 per cent ad valorem was claimed dutiable as surface decorated paper at only 4½c per pound under par. 1305, and the importer's protest was sustained (Borden & Riley Paper Co., 234679-G.)

Board of Tax Appeals Decision—In Champion Coated Paper Co., (Docket No. 19278), the U. S. Board of Tax Appeals

The

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Daily Capacity
525 TONS

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General Sales Office

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allowed an additional depreciation on plant during a period when it was operated abnormally. The company had claimed that the federal taxing authorities had employed rates unjustifiably low in the computation of depreciation of machinery and equipment, and further alleged that it was entitled to deductions for amounts paid as assessments against benefits of a conservancy district in which its properties were located.

Court of Appeals Sustains Trade Mark Decision—In an appeal from the ruling of the Commissioner of Patents, the court held that where the Carew Mfg. Co. had for years been manufacturing paper and using as a watermark thereon the words "Treasury Bond" and entered into an agreement with the Empire Paper Co. to sell such paper in the Chicago market, marking it "E. P. C. Treasury Bond," the Carew Company did not by this transaction lose title to the mark and the Empire Company who had ceased to purchase paper from the Carew Company, but procured paper elsewhere and similarly marked it, was not entitled to register that mark. (Empire Paper Co. vs. Carew Mfg. Co., No. 1931.)

Other Court Decisions—The Commissioner of Internal Revenue rejected a deduction by the S. G. Sample Co. by which the taxpayer's inventory was reduced 25 per cent from the value there shown, the reduction being claimed to accurately represent the decrease in value of petitioner's stock of merchandise between the date of purchase and date of inventory. The Board of Tax Appeals affirmed the Bureau's findings, but on review by the U. S. Circular Court of Appeals (5th Cir), the court reversed this finding, on the ground that to arbitrarily reject the deduction amounted to a denial of the taxpayer's right to submit evidence in support of its claim, and that an inventory need not include market value for each article if the cost has been shown (No. 5211).

Consignments—Where a consignor delivers property to a common carrier for account of a consignee, pursuant to a contract for its sale at a stipulated price delivered at an agreed point of destination, the transportation service is rendered for the consignor, and he is liable for the transportation tax imposed by Section 500 of the revenue act of 1918 upon the payments for the same which he made to the carrier says a recent Treasury Decision (T. D. 4125) based on the finding of the U. S. Court of Claims in F. R. Long & Co. case.

Recent Postal Affairs—Negotiations are pending for an international postal insurance service with 26 foreign countries. Insured mail can now only be sent to Canada, Great Britain, Irish Free State, Newfoundland, Netherlands and Portugal.

Special delivery articles for foreign countries must be marked "express" if fast delivery is wanted, says the Postmaster General. Many packages are prepaid for such delivery but are not marked "express."

The Postmaster General recently inaugurated a new drive to insure the prompt delivery of special delivery mail throughout the country, and has requested postmasters to give this phase of the postal service their personal attention.

A revised list covering the compulsory and optional sealing of foreign parcel post packages has just been announced by the Post Office Department.

Abuses of facilities of the postal service for tracing stray shipments of packages sent by parcel post in wholesale lots, especially those containing unsolicited merchandise sent on approval, are to be curtailed by the department according to a recent ruling.

The Postmaster General has promulgated a new order amending the postal regulations to help large mailers in correcting their mailing lists, the new order affecting principally advertisers using 3d and 4th class mates and selling by mail. (Order No. 5812).

The post office department has now obtained special delivery for mail to 30 countries, according to a recent announcement.

Simplified Export Procedure—Simplification of export procedure through use of the through export bill of lading, which enables an exporter in the interior of the U. S. to make shipments to a foreign destination on one through shipping document, is under consideration by the Department of Commerce. Direct shipment from seller to buyer without the aid of intermediary, prompt collection of payment for merchandise,

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THE
FOXBORO COMPANY
GUARANTEES TO REPAIR OR REPLACE FREE OF CHARGE WITHIN ONE YEAR FROM DATE OF SHIPMENT, ANY INSTRUMENT THAT DOES NOT PROVE PERMANENT IN CALIBRATION AND FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL
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as used in the

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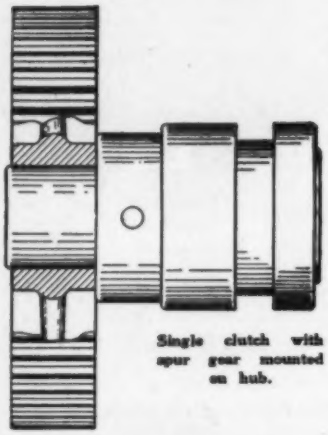
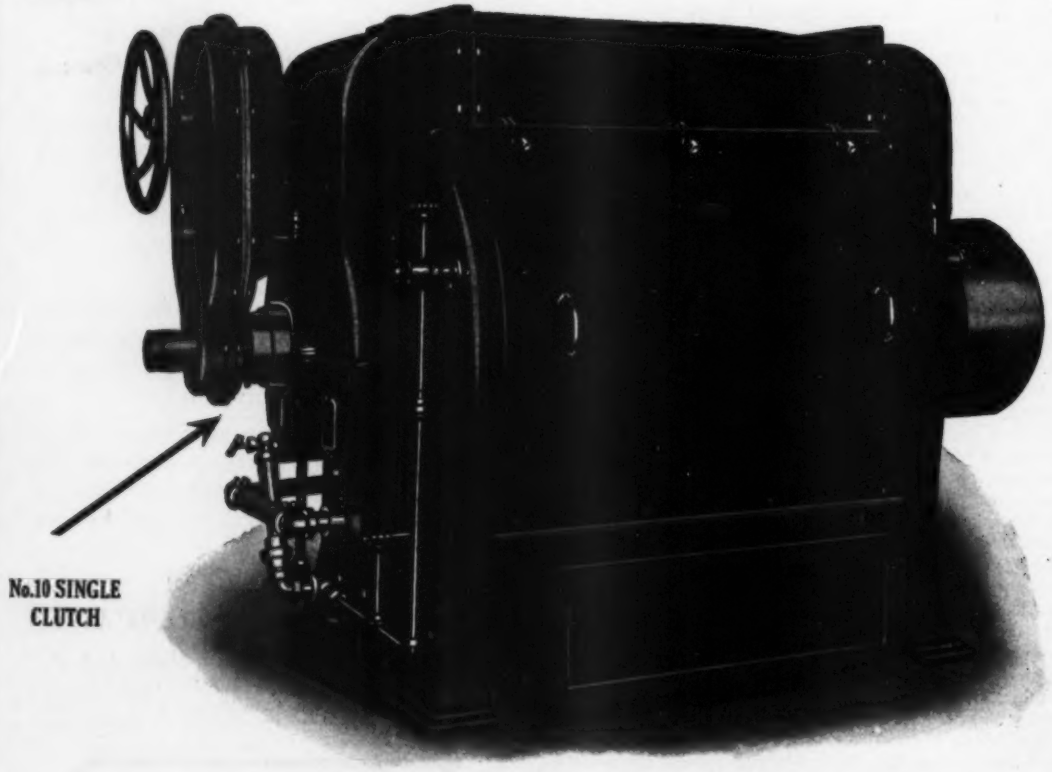


Single clutch with spur gear mounted on hub.

Reed-Spafford Pulp Screen

The No. 10 JOHNSON Single Clutch with spur gear is installed on this Reed-Spafford Pulp Screen, a machine noted for its large capacity and low power consumption. The clutch is used on the pulp screen plate revolving mechanism, operating TWENTY-THREE hours per day —a hard day's work well done the year round by the JOHNSON. There's a JOHNSON Clutch for every light-powered Paper Machine. Equip with JOHNSONS.

Write for Catalog "P. I."



No.10 SINGLE CLUTCH

COURTESY: The Improved Paper Machinery Co., Nashua, N. H.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

exemption from certain embargoes, limited free storage at the port of export, and many other advantages are said to accrue to the user of the through export bill of lading.

Data on Warehousing—For the first time, statistics are being collected on the operations of merchandise warehousing on a national scale. The Bureau of Census is obtaining data on the occupied space and movement of goods through warehouses, and will publish the data within the next few months, which will summarize national conditions, the value of goods passing into and out of merchandise warehouses, and arranged by the larger cities.

Responsible Bidder—A responsible bidder for government contracts must himself meet a set of standard specifications in the opinion of the Federal Purchasing Board, and a definition of a responsible bidder has just been made public as one who (1) qualifies as such under the laws and lawful regulations governing the purchase of articles in question; (2) has complied with all of the requirements of the advertisement for bids; (3) is a manufacturer of or a regular dealer in the articles which he offers to supply; (4) is in position to perform the contract; and (5) has not previously failed to perform properly or complete on time contracts of a similar nature.

Paper Supply Bids—Bids for fifty million pounds of paper for public printing and binding were opened by the Joint Committee on Printing of Congress recently. Thirty-nine bidders competed for this order, which is a paper supply sufficient for one year beginning March 1st, embracing 184 lots.

State and National Taxes—The U. S. Chamber of Commerce is making a nation-wide study of state and local taxation, particularly in its relation to curtailing and hampering business activities and cutting down the high-tax burden which business bears. It is hoped by this investigation to put "taxation" on a more efficient and equitable basis, and to check this rising tide of taxes which is a stumbling block to business on every hand.

National Wholesale Conference—The groundwork for a comprehensive study of the problems of wholesaling was laid in a 2-day session held in Washington recently under the auspices of the U. S. Chamber of Commerce, where more than 200 of the country's leading jobbers attended the First National Wholesale Conference ever held in the United States. Group buying, hand-to-mouth buying, price fluctuations, unfair competition, style changes, simplification and standardization of commodities entering commerce, anticipation of market needs, questions of finance, warehousing, delivery, cash discount privileges, bad debt losses, abuse of trade terms, price cutting, etc., will be studied, and at the next conference standard practice instructions developed for the entire industry as a whole.

Wholesale Prices—Index numbers of wholesale prices by groups and subgroups of commodities with 1926 as the basis of 100 are shown in the following comparison tables:

	Dec. 1927	Jan. 1928	Jan. 1927
Paper and pulp	90.	90.9	93.
Purchasing power of dollar (cents)	110.0		

On the basis of 550 commodities wholesale prices in January averaged slightly lower than in December, or about ½ of 1 per cent and compared with a year ago 1-3 of 1 per cent. Of the 550 commodities increases were shown in 166 and decreases in 135 between December and January, while in 249 no change in price occurred.

Employment—Employment and pay roll totals in manufacturing industries with 1923 as the basis of 100, is shown in the following table:

	Employment			Pay-roll totals		
	1927	1928		1927	1928	
	Jan.	Dec.	Jan.	Jan.	Dec.	Jan.
Paper and printing..	104.3	105.4	103.8	112.7	117.0	113.8
Paper and pulp.....	94.4	92.3	91.3	100.0	99.9	97.4
Paper Boxes	98.9	100.6	95.8	105.8	113.3	106.6

Employment in manufacturing industries decreased 1.1 per cent in January as compared with December and pay-roll totals decreased 3.9 per cent.

(And you know what it is)

"THE acceptance of Dayton High Speed equipment in more than 70 mills leaves no room for doubt regarding the kind of a beating job Daytons do.

Its up to us to find out right now what Daytons can do for us."

The Dayton Beater & Hoist Co., Dayton, Ohio

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DAYTON HIGH SPEED BEATERS

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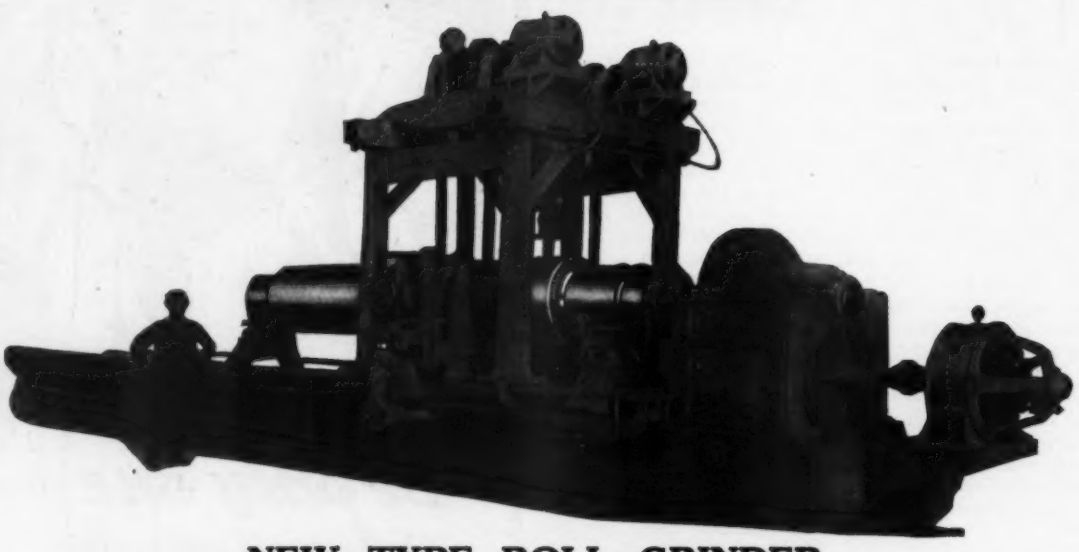

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Built in 24″, 32″, 36″ and 42″ sizes, all Electrically driven throughout and equipped with New Crowning Device, Geared Head and Automatic Lubrication.

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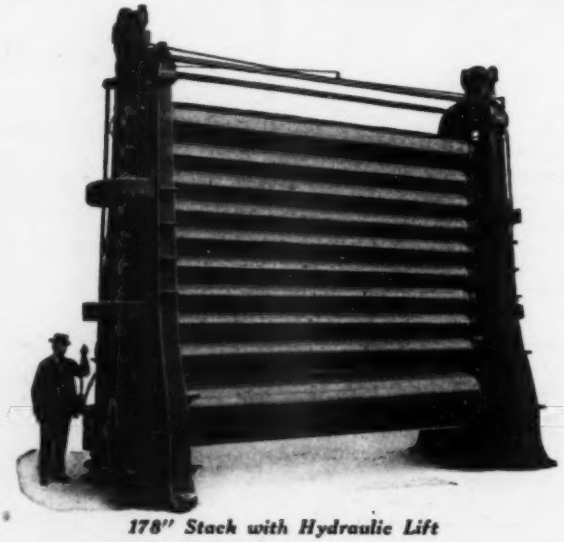
are made with HYDRAULIC, ELECTRIC or RATCHET LIFT all operated from the floor



178″ Stack with Hydraulic Lift

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MICHIGAN NEWS

Joint Meeting of Superintendents and Cost. Ass'n

Some of the accomplishments of the Superintendents Association of the American Pulp and Paper Industry were reviewed Thursday evening, February 16, by Fred Rooney, national president, who was the chief speaker at a joint session of the Michigan Division of Superintendents and the Kalamazoo Valley Division of the Cost and Technical Association of the Paper Industry. This gathering was held at the Park-American hotel Kalamazoo and brought out a large attendance.

President Rooney said his organization plans to do greater things in the future than have been acomplished in the past. He expressed his favor of joint gatherings of those interested in various phases of the paper industry.

Ivar Lundbeck of the Lee Paper Company, Vicksburg, gave a fine paper on "Sources of Dirt; in Pulp and Paper." He outlined certain methods to eliminate that evil.

Expansion Planned by Mac Sim Bar Paper Co.

The Mac Sim Bar Paper Co., Otsego, is planning to spend at least $500,000 to increase the capacity of its mill. That decision was reached at a recent meeting of the directors at which time it was unanimously voted to authorize President Charles E. Nelson to take steps to have plans for the proposed enlargement prepared and submitted for consideration.

According to President Nelson, one of two plans will in all probability be adopted. One contemplates the installation of a large cylinder machine in the basement of the mill. The other is to add sufficient dryers to the present machines to bring about the desired results.

The plant is now equipped with one 126-inch six cylinder machine and one 142-inch seven-cylinder machine. Their combined output is placed at 180 tons in 24 hours. Originally these two machines made about 100 tons of board a day and the capacity was expanded to the present tonnage through the installation of proper power facilities and by the addition of dryers. At the same time the cost of labor was not in any way increased. The increase now proposed will raise the capacity to over 250 tons.

The adoption of either plan will necessitate the expansion of other departments. This can easily be done, the company having been permitted to close an east and west street for that purpose, thus allowing the erection of necessary buildings. President Nelson admits it will require considerable time before definite plan of action is arrived at. The matter of comparative costs will be gone into carefully.

Paper Mill Technologist Club Meets

The Paper Technologist Club held a dinner session, February 1 at the Columbia hotel, Kalamazoo. Two papers were given following the dinner hour.

Frank Whittington, of the Standard Paper Co., took for his topic, "Relation between Hydrogen Ion Concentration and the Hydration of Sulphite and Rag Fibers." This was based on a review of recent literature covering this subject. Arthur Dreshfield, chemist of the Western Paper Makers Chemical Company, read a paper on "Theories of the Underlying Methods of Testing Resin Size."

Michigan Paper Co. Elects Officers

George W. Gilkey, formerly secretary-treasurer, and general manager of the Michigan Paper Co., Plainwell and Kalamazoo, was elected president and treasurer of the concern at the annual meeting of the stockholders and directors. Under his management this company has made excellent progress.

The stockholders also paid tribute to the long and faithful services of William Thomas, who during his active business life was general superintendent of the plant, by naming him

Starting—a critical moment for felt and paper

CARELESS starting—jerky acceleration of paper machines—has ruined many felts, caused countless paper breaks.

With C-H Magnetic Clutches there can be no careless starting. The acceleration is accomplished automatically and smoothly without jerk or jar. Simply pressing a button causes the clutch to pick up the load smoothly and gradually. This saves the felts, prevents paper breaks, decreases wear on equipment, saves time and reduces starting current peaks.

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Pioneer Manufacturers of Electric Control Apparatus
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An Interesting Story.
C-H Magnetic Clutches — their construction — features — uses — are fully described in this Booklet (P-11). Every paper mill executive will find much useful information in it. We'll be glad to send you a copy.

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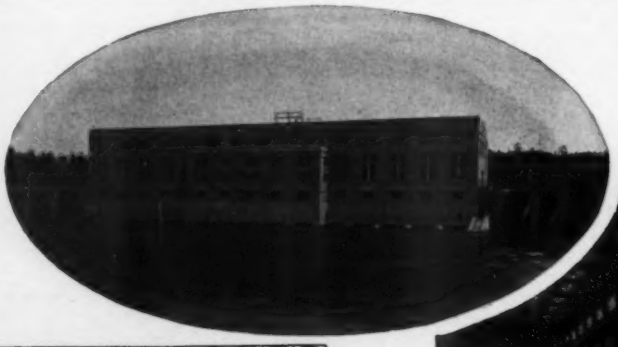
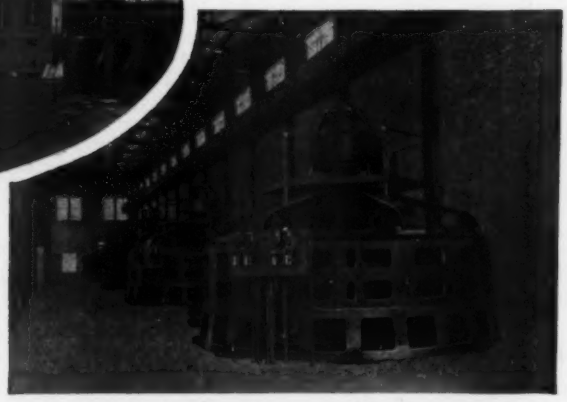
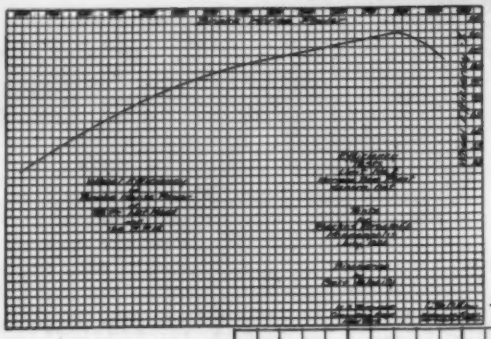


EFFICIENCIES THAT ARE WORTH WHILE





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The results obtained always justify their installation.

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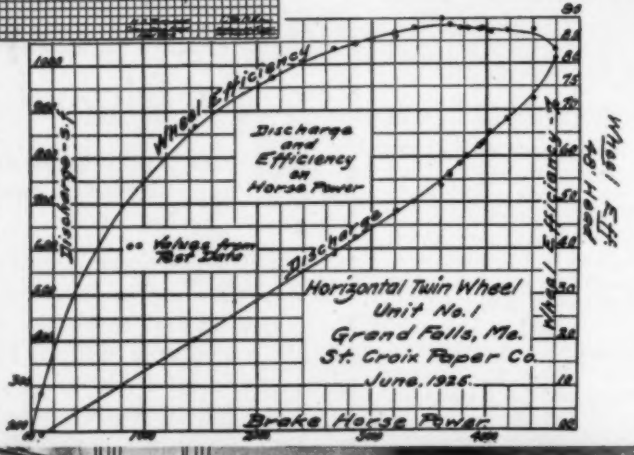

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director emeritus. Another step taken was acceptance of the resignation of E. A. Stowe, Grand Rapids, as director. He has for years been counted a valuable member of the board.

To fill these two vacancies, W. J. Lawrence, Kalamazoo, and E. M. Stone, Allegan, were made directors. Those on the board re-elected were H. Clare, Jackson, Kalamazoo; G. W. Gilkey, J. B. Wagner, H. J. Mesick, Plainwell; George M. Ames, Grand Rapids; B. D. Kepple, Henry Pilgrim, Holland.

J. B. Wagner was elected vice-president and J. C. Handy, secretary.

Western Board and Paper Co. Marks 20th Year

On February 2nd, twenty years ago, the Western Board and Paper Co. was organized with a capital of $100,000. A one-machine mill was built along the banks of the Kalamazoo River at the rear of the Kalamazoo Paper Co.'s plant. The output was 40,000 pounds of box board.

Within this twenty year period, the capital of the company has increased to $300,000; and new equipment has been added. The company now has an output of about 200,000 pounds per day. Alfred E. Curtenius is president and W. A. Hodge manager and secretary.

Eddy Paper Corp. to Expand

The Eddy Paper Corp., Three Rivers, Mich. is planning improvements and additions which will cost from $75,000 to $100,000, and necessitate the employment of from 50 to 75 more men.

Plans for the addition to the box shop are complete and call for an extension of 50 feet on the roll pit and 80 feet on the box shop. The additional space will provide for storage double the present capacity and afford an increase in stock production of about 100 tons daily. The construction will be of brick and concrete. Work will begin as soon as the weather will permit.

Process to Make Newsprint of Old Papers

Reclaiming old newspapers so that the stock can be reconverted into newsprint without use of any new pulp, is a process claimed by Emil Kellner, of Kalamazoo. Kellner further claims that after this material has been aged and weather beaten, it will not change color, if previously put through the process indicated.

Kellner has submitted samples of his processed stock and says his experiments have been the result of years of study in mills and laboratories in both Germany and the United States.

The process has been patented and the Excel Paper Corp. organized. The plan is to manufacture newsprint and all other high grade paper products. Stock has been placed on the market and further announcement as to the location of the mill will be made at a later date.

Officers of the new company are: President, Emil Kellner; vice president, Frank Eichelberg; secretary-treasurer, M. D. Kellner.

Lincoln Mill's Case Ruling Withheld

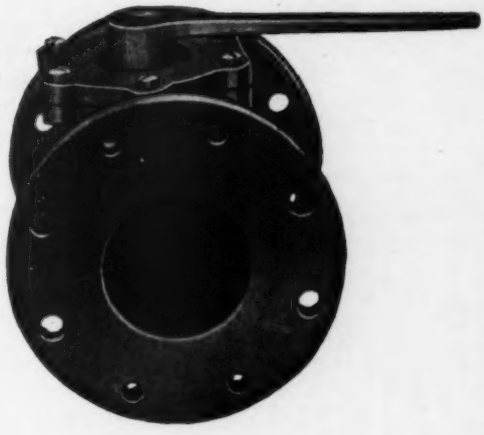
The case of Fred G. Dewey et al. which asks a receiver for the Lincoln Paper Mills, Elkhart, Ind., was under consideration February 15th in the Elkhart superior court. According to advices from Elkhart, the defendants introduced a demurrer, asking the court to amend the original complaint.

The hearing on January 24th was interrupted when Judge William B. Hile held that an amended complaint should be filed, making certain facts clearer.

This amended complaint having been filed, the defense demurred. Several hours on Wednesday were devoted to hearing arguments of attorneys on both sides. At the conclusion of the session, Judge Hile withheld a decision.

The Sutherland Paper Co., Kalamazoo, is increasing the capacity of its plant from 100 to 110 tons a day. This is being done, according to L. W. Sutherland, president, largely through rebuilding the cylinder machine, adding several

"Repeat Orders Are the Best Indorsement"



Built for Your Purpose!

THE Barker Quick Opening Stock Valve meets all the requirements you place on it—with features which all mill men have been seeking.

Simplicity and strength are both present. This valve is built on an entirely different principle from other gate valves, in that a straight bronze plug is used instead of a gate, with a cast-iron body designed to reduce plugging to a minimum. Has no bonnet to leak. Valve is furnished with a long handle to open and close, with sufficient leverage to shear off ordinary obstruction without using a piece of pipe. Valves may be placed in any position.

The Barker Quick Opening Stock valve **does not require cleaning** after each different color or grade of stock has passed through. The many repeat orders being received by us are the best proof of satisfaction.

Install this valve and note the difference.

GREEN BAY BARKER
Machine & Tool Works
Green Bay Wisconsin
"Machinery Manufacturers"

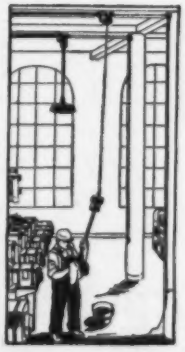
"Why up in the Air"—

—when reflectors can be cleaned more frequently, safely and thoroughly down on the ground?

They are worthless unless kept in a reflecting condition. Dirty reflectors do not reflect.

Why install a lamp where it cannot be cleaned at all —or only by the climbing process?

The THOMPSON Safety Lowering Switch or Disconnecting Hanger enables overhead lamps to be lowered away from the electric circuit for cleaning the reflectors or renewing bulbs. The advantage is obvious. The Hanger is inexpensive and easily included in present installations. For outdoor and indoor use.



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Cable Address: "Hardistock." A. B. C. 5th Edition, Bedford McNeill, Western Union, Bentley's.

dryers, etc. The machine cuts approximately 90 inches wide and practically all the product is required to meet the company's demand for carton board.

The Consolidated Paper Co., Monroe, has declared its regular quarterly dividend on the common stock of 1¾ per cent. It is payable March 1st for stock of record of February 20.

Bangor may have a paper mill yet. This was indicated this week when a representative of a New York corporation investigated the local water supply and conferred with Bangor landholders in an effort to find a good site. According to report, the New York firm is ready to invest $500,000 in a paper mill if Bangor citizens furnish the land.

Shirley W. Allen, who for the past four years has served The American Forestry Association as forester at Washington, has resigned to become Extension Professor of Forestry in the School of Forestry and Conservation at the University of Michigan. He will take up his new duties April 1.

Jacob Kindleberg, president of the Kalamazoo Vegetable Parchment Co., addressed the banquet of the Grand Rapids Industrial Executives Club at Grand Rapids, February 3. Mr. Kindleberg took as his subject "The World's Third Largest Industry."

Earl McCarty, an employee of the Bryant Paper Co. recently sustained injuries when he was hit by a board which fell from a scaffold.

SOUTHERN NEWS

First Paper Mill in Arkansas

The first paper machine at the new Camden, Arkansas mill of the International Paper Company, was started less than eleven months after the beginning of construction. The second machine is now in operation and the plant has been entirely completed.

The mill has a capacity of 160 tons of kraft paper a day, and is located in the same fast-growing short leaf and loblolly pine belt as the other two Southern kraft paper mills of the Company at Bastrop, La. Because of their long fibers, freedom from pitch, and greater uniformity of texture, these species of pine are better adapted than others to the manufacture of kraft paper. These pines are naturally very prolific seeders and grow much faster than Northern Spruce, producing pulpwood in fifteen to twenty year periods as compared with three to four times that rotation for spruce in the Northern port of the continent.

The Camden mill is the first paper mill in the State of Arkansas, and is the third Southern kraft paper mill to be erected by this company, the other two mills being at Bastrop, La. The company's three Southern mills have a capacity of approximately 430 tons of kraft paper per day.

Bates Valve Bag Corp. to Erect Southern Plant

To serve the South, the Bates Valve Bag Corporation, Chicago, announces the building of a factory in Birmingham, Ala. for the purpose of supplying the rapidly increasing demand for its products. The major product to be manufactured at this plant is the multi-wall paper bag, which has proven to be the most satisfactory container yet offered to cement, plaster, lime, and other rock products manufacturers for their products.

As an initial unit, the Bates Valve Bag Corporation will erect a factory approximately sixty feet wide by two hundred and fifty feet long, one story in height of fire proof construction, modern in every respect and affording ideal working conditions for those to be employed.

The erection of this plant in the South will enable the Bates Valve Bag Corporation to render a service not heretofore en-

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

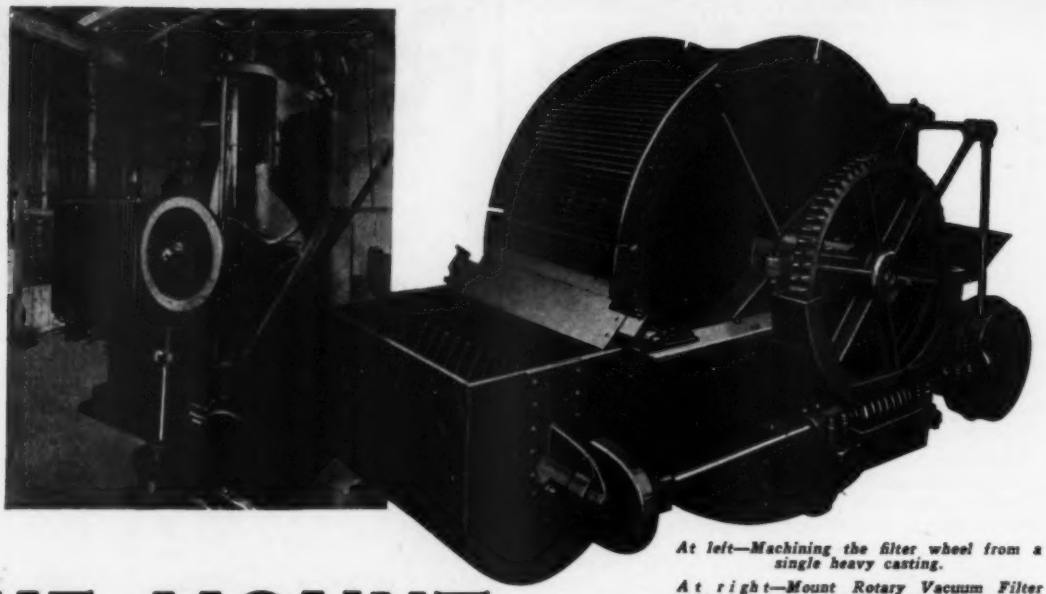
STEEL

8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock

Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

LAWRENCE MACHINE & PUMP CO.
LAWRENCE, MASS.

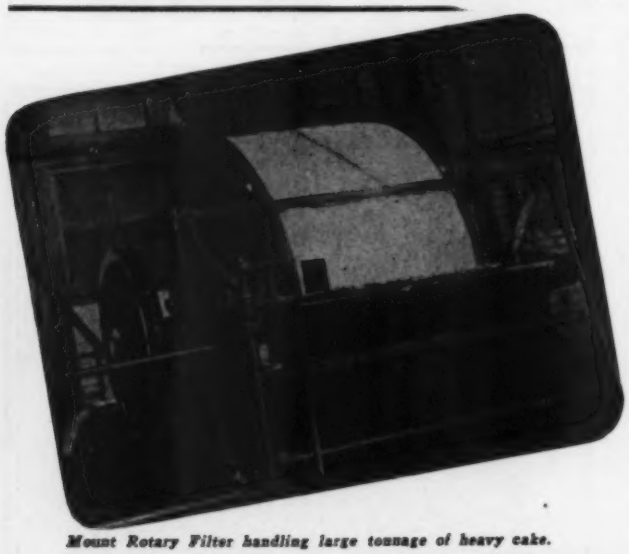
Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery



At left—Machining the filter wheel from a single heavy casting.

At right—Mount Rotary Vacuum Filter equipped with resludger for continuous handling and washing of lime sludge in recovery department of sulphate mill. (Shop view with wire cloth removed.)

THE MOUNT ROTARY VACUUM FILTER



Mount Rotary Filter handling large tonnage of heavy cake.

answers the demand of the pulp industry for continuous equipment. The distinct success of this equipment through years of service proves that it is truly continuous, with time of shutdown for repairs practically eliminated. The fundamental design removes the cause of many shutdown periods experienced with some vacuum filters and the ruggedness of construction overcomes all mechanical difficulties.

We will gladly consult with you regarding any special problems. Descriptive bulletins on request.

SWENSON EVAPORATOR CO.

(Subsidiary of Whiting Corporation)

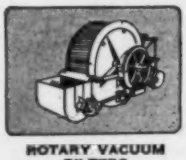
15673 Lathrop Ave., HARVEY, ILL. (Chicago Suburb)

SWENSON

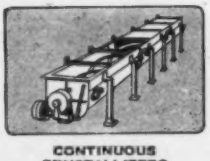
BASKET TYPE EVAPORATORS

VERTICAL TYPE EVAPORATORS

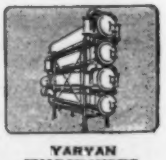
HORIZONTAL TUBE EVAPORATORS



ROTARY VACUUM FILTERS



CONTINUOUS CRYSTALLIZERS



YARYAN EVAPORATORS

joyed by those requiring a multi-wall paper bag and by manufacturing these bags in the South, the product becomes immediately a Southern product manufactured by Southern labor for use in the South.

Suwanee Forest

In Southeastern Georgia there lies a 200,000 acre tract of Long Leaf and Slash Pine timber, locally known as Suwanee Forest. This tract was assembled and purchased by the Western Paper Makers Chemical Co. of Kalamazoo, Mich. a few years ago to serve as a nucleus of its supply of Naval Stores used in the manufacture of rosin size of which this company is a very large producer. Suwannee Forest is unique in several particulars; it is probably the largest area of second growth pine timber in one compact body under one ownership in the South. It is probably the largest area of timber under sustained yield management in the South; and it is the largest tract under one ownership in America, the title to every acre of which is held under the Torrens system of land registration.

The Superior Pine Products Co. was organized in 1925 to take over and operate this tract of timber. It is the policy of the company to operate for continuous sustained production, that is to say the timber will be turpentined and logged only as fast as new timber grows to take the place of that removed. The company operates for Naval Stores as the main product, but it utilizes to the fullest extent the timber and the land, cutting lumber, cross ties, poles, piling, pulpwood, retort wood and fuel wood. It also raises cattle and realizes an income from the annual take of fur-bearing animals, and from the hunting privileges.

Due to the favorable character of the soil and climate, the growing of new crops of timber on lands cut over in process of operation is very simple—nature does it all. All that is needed to assure a continuous succession of crops of timber is the protection of the lands from the annual forest fires.

WISCONSIN NEWS

Foremen's Safety School Well Attended

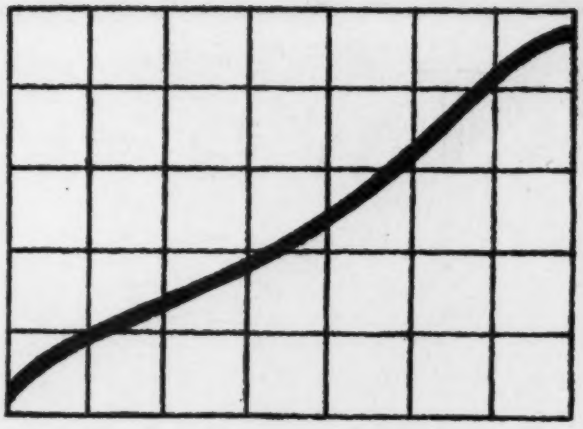
Good attendance marks each session of the Foremen's Safety Schools in Green Bay and Appleton, where the majority of the students are employees of paper mills. Two hundred seventy-five persons were at the Appleton meeting addressed by A. S. MacArthur, educational director of the Kimberly-Clark Company, Neenah, who spoke on the necessity of completely guarded machinery and the importance of the human factor in keeping them guarded.

At a recent session of the Green Bay school, S. H. Slaymaker, personnel director of Fairbanks-Morse Co., Beloit, spoke on the subject of "Handling Men." He made the statement that the man in the shop who does not recognize authority is usually the man who gets hurt. Constituted authority in industry is the workman's greatest protection. J. M. Conway, of the Hoberg Paper Company, was chairman of this session.

A high honor has also been conferred upon Mr. S. F. Shattuck, treasurer of the Kimberly-Clark Co. of Neenah, Wis., by his selection as athletic commissioner of the newly formed Wisconsin conference of minor colleges. He will hold an office similar to that of Judge K. M. Landis in big league baseball or to that of Major Griffith in the Big Ten Conference of midwest universities.

The national paper mill safety contest, in which THE PAPER INDUSTRY is giving prizes is attracting great interest in the two mills of the Marinette & Menominee Paper Co., which are entered. The illuminated bulletin boards are daily watched for progress in the contest.

The Interlake Pulp and Paper Division of the Consolidated Water Power and Paper Co., Appleton, Wis., has installed six sand filters as a means of assuring pure water and doing away with discolored pulp. This method takes the place of its



More Warren Pumps were installed last year than in any of the 30 years we have been in business.

WARREN

We shall be glad to send you Bulletins on Warren Centrifugal and Reciprocating Pumps, covering the services in which you are interested.

Warren
Steam Pump Company
Incorporated
Warren, Mass.

Atlanta, Boston, Charlotte, Cleveland, Dallas, Kansas City, New Orleans, New York, Oklahoma City, Philadelphia, Pittsburgh, St. Louis, St. Paul, Seattle, San Francisco, Scranton, Toronto

1528

Two of Many

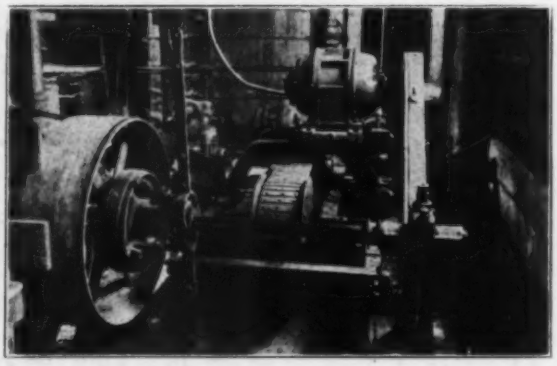
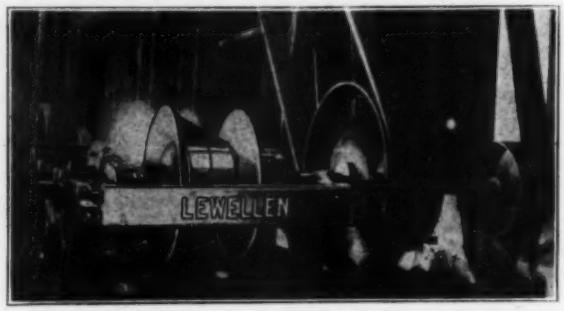


Photo above illustrates a Lewellen No. 15, class "H" Complete Ball Bearing Transmission driving a binder board machine at the Kerr Paper Mills, Downingtown, Pa.

Photo below illustrates a No. 14, class "D" Lewellen Transmission driving a Black-Clawson Cutter at the Michigan Carton Company. Machine speed—50 to 250 F. P. M. Sheet length—16½" to 82½" at any speed.

Since writing this advertisement we have received orders for four transmissions of this type from other large paper mills.



THE above photographs illustrate just two of the many installations of the Lewellen Variable Speed Transmission in paper mills. There are hundreds of others, in a large number of mills, driving most every type of machine used in the manufacture of paper.

The number of installations, and the number of users, is increasing daily. Paper makers recognize that for steady, uninterrupted operation the Lewellen is the transmission for them to buy. They recognize that the Lewellen is superior to other types of transmissions because of the close attention given to details of design by an organization that maintains the highest standards of materials and workmanship. Paper makers realize the value of over twenty-five years of experience and sound engineering practice back of every Lewellen transmission made.

Let us tell you more about the Lewellen and the work it is doing in paper mills. Just drop us a card.

LEWELLEN MANUFACTURING CO.

Columbus, [LEWELLEN Variable Speed TRANSMISSION] Indiana

chemical treatment and settling basins. Three of the sand filters are of the high head gravity type built by the Norwood Engineering Co. They measure 16x18 ft., and have a daily filter capacity of 1,000 gallons.

A new 8,000 h.p. steam turbine was recently put in operation by the Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis., supplying current for paper mills in that city, Biron, Stevens Point, Wausau, and Nekoosa and Port Edwards.

William Karlmund, an employee of the Manitowoc Engineering Works, was killed when he fell from the hopper of a drum barker in the wood room of the Kimberly-Clark Company's plant at Kimberly, Wis., where he was doing some work for his company.

Wisconsin Carton Co. to Erect New Plant

A new carton factory will be erected in the Fox River Valley as shown in an announcement made recently by the Wisconsin Carton Company of Neenah, Wis. The Valley Paper mills located at West Menasha, Wis., sold its mill site for the factory. A series of amendments to the articles of incorporation made possible the financing of the project. The capital stock has been increased from $100,000 to $200,000.

The company was incorporated last July when it was reported that it would take over the former Elm Paper and Box Co. of Neenah. The chief owners are J. T. Mader, of Appleton, Wis., A. J. Danke, of Neenah and A. Schwartzbauer, of Menasha. The Valley Paper Mills was organized shortly after the war for the purpose of manufacturing glassine and grease-proof paper, but being under financed, the project never materialized.

The need for expansion has induced the Rhinelander Paper Co. of Rhinelander, Wis., to start a building campaign. A new power house and a finishing room are expected to be completed by June 1. A new paper machine will also be provided. The result of this program of expansion will be an increase in daily exports from 20 to 30 tons and an additional force of men.

The following officers were elected at the annual meeting of the Ahdawagam Paper Products Co. of Wisconsin Rapids, Wis.: H. A. Sampson, president; I. P. Witter, vice president; F. R. Walsh, secretary-treasurer and manager, and G. W. Mead and P. C. Daly. Reports at the meeting show that business increased 25 per cent for 1927 and that 1928 is expected to better the mark. The company now has 70 workers.

According to a survey made by the Wisconsin Manufacturers Association, wages of paper mill employees in Wisconsin averaged $25.25 per week during the past year, which is reported to compare favorably with other lines of industry in the state. The general average wage was $25.45.

Purchase of an additional tract of land in Milwaukee by the Hummel & Downing Co., Milwaukee box manufacturers, will provide for prospective expansion. The purchase includes seventeen lots fronting on the Milwaukee River and represents an expenditure of about $50,000.

George W. Mead, president of the Consolidated Water Power and Paper Co. of Wisconsin Rapids, Wis., has been appointed by Governor Fred R. Zimmerman as a member of the board of regents of the University of Wisconsin, of which institution he is a graduate. He is also a member of the board of trustees of Beloit College.

Charles Martin, who resigned as superintendent of the Menasha Paper Mills, Menasha, Wis., to accept a position in a Pacific coast paper mill, has been succeeded by H. E. Moore, formerly in charge of the Ball Brothers Paper Mills, of Noblesville, Ind. Additional electric motors have been installed in the Menasha plant.

At the annual meeting of stockholders of the Consolidated Power and Paper Co. at Wisconsin Rapids, the old board of

The **Difference**
that brings a smile

Between the pulp and the finished sheet many factors enter into the making—many processes are employed —many conditions must be met and overcome—and when at last a sheet like this appears—it brings the smile of achievement.

The roll plays an important part. It must be of such uniform quality and hardness—of such unvarying density that it reduces variation in paper to a minimum. For 22 years we have been giving a specialized service in roll covering to the paper industry, and we have full confidence that we can please you. Send us your next roll.

Speedy Service Assured Satisfaction

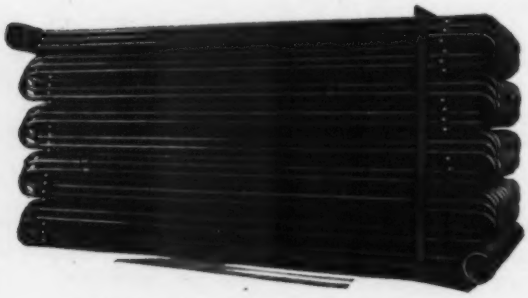
A World of Service in Pacemaker Belts

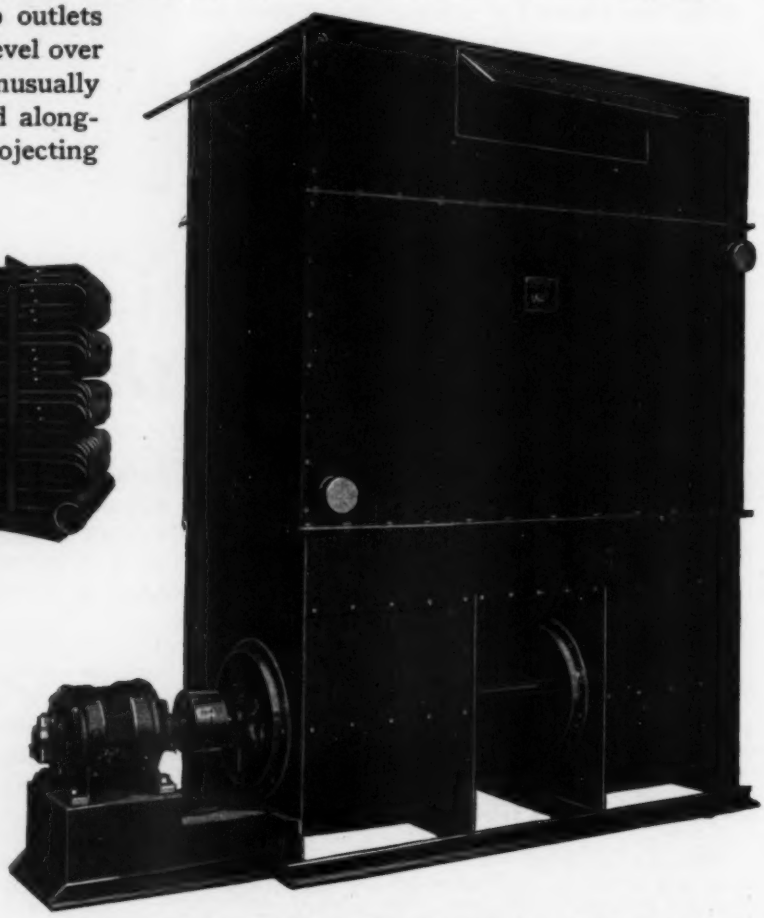
Let Pacemaker supply your belting needs

THE CINCINNATI RUBBER MFG. CO.
Cincinnati, Ohio

Lower heating costs
with this improved hi-pressure heater

Buffalo Type "AA" Unit Heaters give better heating results at lower cost through use of high pressure steam and the effective distribution of this heat throughout the entire working zone. They draw in the cold air from near the floor line and recirculate the heated air from the top outlets down through the working level over a wide area. And being unusually narrow they may be installed alongside of columns without projecting too far into working space.





All-Steel Assembly

The all-steel heating coil assembly, tested under hydraulic pressure, enables the Buffalo Type "AA" to use high pressure steam. This reduces the cost per heat unit and also enables each heater to serve a larger area. Buffalo Conoidal Fans provide a positive circulation of the warm air through the working area.

Write for Specifications

Bulletin 2506-P describes the advantages of Buffalo Type "AA" Unit Heaters for industrial use. A copy is yours without obligation.

Let our Engineering Department work with you on your heating problem. Branch engineering offices in principal cities.

Buffalo Forge Company
213 Mortimer St., Buffalo, N. Y.
In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
"Heat With Unit Heaters"

1878 "Buffalo" 1928 — **"Air Engineers for Fifty Years"**

directors was re-elected and it was voted to increase the number of directors by two. The board was empowered to make the selection. The officers and directors, as re-elected, are George W. Mead, president; R. L. Kraus, vice president; E. B. Redford, secretary; Stanton W. Mead, treasurer, and T. W. Brazeau. Reports showed that 1927 was a very productive year.

Shipments of pulp wood arriving in Appleton and neighboring paper mill cities have increased to such an extent that it requires now two or three trains to carry them.

A small fire occurred last month in the plant of the Peshtigo Paper Co., Peshtigo, Wis. It started in a chip bin in the tower and it was several hours before it was extinguished.

With the consolidation of Dever Brothers, Milwaukee, with Flint Paper Company, of the same city, thirty-five years of business activity of the former paper jobbing concern was ended. The enlarged company will drop the retail business entirely and cater only to the needs of manufacturers and wholesalers in Wisconsin and Illinois.

Marathon Paper Mills to Make Improvements

Considerable improvements will be made at the Lake Superior Paper Mill, of Ashland, which now is property of the Marathon Paper Mills Company, of Rothschild, Wis. Some of these will be made on the embossing machinery, and additional printing equipment will be provided to make possible the placing of names, trademarks, etc., on paper napkins manufactured.

Part of the $50,000 improvement fund will be spent on beautifying the grounds. Last year a $22,000 warehouse was built at this plant. The mill employs about 88 workmen, and consumes about 400 to 600 tons of sulphite monthly. Rudolph Meyers is manager of the plant.

The Commercial Package Corp. is the name of a new paper box manufacturing concern at Eau Claire, Wis. Incorporators are Raymond B. Webster, Alfred I. Fagerld, and I. C. Barager.

The Flambeau Paper Co., Park Falls, Wis., is sponsoring an essay contest among the pupils of the local high school, the subject being the Flambeau Indians.

The Green Bay Foreman's Safety School has proposed an inter-city safety contest between the foremen's evening schools of that city, Appleton, Sheboygan and Oshkosh, on the issue of which city would have the fewest accidents during March and April.

A Milwaukee wholesale paper company, the Ray C. Koepke Co., has filed articles of incorporation with the secretary of state and capitalized at $25,000. Owners besides Ray Koepke are Louise and Virginia Koepke.

An experiment in the adaptability of New Zealand pine and tawa wood for pulp manufacture is being made at the Ladysmith, Wis., plant of the Great Western Paper Co. for the New Zealand government under the direction of experts from the United States Forest Products Laboratory, at Madison, Wis. It is hoped that it will prove whether the wood will find a good market in America. About two carloads of the wood have been received. The wood is used extensively for manufacture of casks, butter kegs, pails and fruit baskets.

At the opening of the will of the late John Alfred Kimberly, founder of the Kimberly-Clark Company, of Neenah, Wis., it was found that all of the estate was left to his seven children. His widow was amply provided for before his demise. The children are: John A. Kimberly, Jr., James C. Kimberly, Mrs. Helen Stuart, Mrs. Jessie Paine, Mrs. Lucy Curtis, Mrs. Mary Shirk, and Mrs. Nancy Bergstrom. Mr. Kimberly was reputed a multi-millionaire.

A. Reinhold Punke, president and general manager of the Economy Paper Co., Milwaukee, Wis., died last month. The company, which he organized, has been in existence for about ten years.

Brush Polisher

Ball Bearing Cylinder Type

Ball bearings for all cylinder brushes on this machine permit running at high speed without any danger of overheating. Most of the excess power absorbed with a plain bearing installation is eliminated in this modern Waldron machine. Dust proof housing caps and Alemite lubrication prevent cutting of bearings by grit and dirt and also protects the goods from oil spotting. An important feature is the proportioned frames that permit assembly with 8 brushes instead of six when desired. Insures uniform brushed finish at high speed making production more profitable.

Operates Independently or in Tandem with Festooner

Rewinder of either slip belt type or double drum type may be used depending upon method of operating this Brush Polisher—independently or in tandem with festooner and coater.

Write for full particulars.

JOHN WALDRON CORPORATION

Main Office and Works—New Brunswick, N. J.

208 W. Washington Street CHICAGO — 30 East 42nd Street NEW YORK

New Birks Bldg.—Montreal, Can.

HARDY S. FERGUSON

Consulting Engineer

200 Fifth Avenue
NEW YORK CITY

Member American Society C. E. Member American Society M. E.
Member Eng. Inst. Can.

Paper, Pulp and Fibre Mills, including Buildings and Complete Mechanical Equipment. Water Power Development. Dams, Storage Reservoirs and other Hydraulic Structures. Steam Plants.

Examinations—Reports—Estimates of Costs—Designs—Specifications—Valuations

CMC

If you use an **ANTICHLOR** in the beater

We Recommend

MERRIMAC BISULPHITE

an effective agent of guaranteed purity

made by

MERRIMAC CHEMICAL CO.

BOSTON

Papermakers' Alum *Iron Free Alum*

Salt Cake

WHAT KIND AND HOW TO USE:

All in the Trade-Mark

HONESTLY—

If you have not used STEPHENSON BAR BELT DRESSING on your transmission belts, you have been neglectful to a very important factor in your plant.
STEPHENSON has, for forty years, on thousands of belts, proven nearly 100% efficient in eliminating the two main belting troubles; viz: SLIPPAGE and DETERIORATION.

Sold by Jobbers the World over.
Write for new circular and free sample.

Made only by

Stephenson Mfg. Co.

Albany, N. Y.

NEW ENGLAND NEWS

Great Northern Elects Wm. H. Whitcomb President

Wm. H. Whitcomb, formerly first vice-president of the great Northern Paper Co., Boston, Mass., has been elected president to succeed the late Garret Schenck.

Mr. Whitcomb has been connected with the Great Northern since 1910, and during the period of Mr. Schenck's ill health, assumed a large portion of the responsibility and management of the company. He is consequently familiar with all details of the office which he takes over.

Wm. H. Whitcomb was born in Clinton, Ind., 55 years ago, and was educated at DePaw and Yale, from which he obtained a degree in engineering. He took up papermaking immediately after graduation, for his family had long had close connection with the paper industry. He entered the employ of the Glen Falls Paper Co. of New York, and became production manager, holding that position until the Glen mill was absorbed by the newly organized International Paper Co. in 1898. At that time began his association with Garret Schenck, who was one of the original directors of the International Paper Co. Mr. Whitcomb became vice-president and later a director, holding that position until his connection with Great Northern.

The present policy of the Great Northern Paper Co. will remain unchanged. The company has shown a profit from the time of its organization, and rumors linking its name with a proposed merger are said to have no foundation.

R. F. McElwain Retires

R. F. McElwain who retires, in order, as he says to make room for younger blood in the organization, has been active in the industry for 47 years, starting as a boy in the Valley Paper Co., of Holyoke.

For two years he worked for a Minneapolis paper merchant, then returned to manufacturing at the Parsons mill and later rejoined the Valley Paper Company. In 1889 he and Clifton Crocker formed Crocker Manufacturing Company which continued successfully for several years until the mill was absorbed in the American Writing Paper combine. Mr. McElwain was manager of the Crocker division and for several years was active as production manager in the general offices. Later he joined his old associate, Mr. Crocker, and founded the Crocker McElwain Co. They expanded, considerably more than doubling their capacity when they took over the Chemical Paper Mfg. Co., in 1913. Both mills have been highly successful.

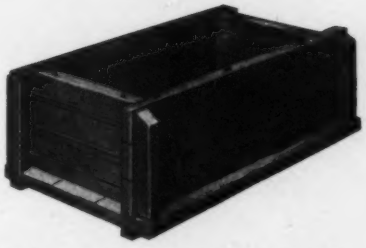
Mr. McElwain retires with the deep respect of his employees and associates. He has taken a personal interest in the welfare of his workers that has been greatly appreciated. He is a director of the New England Council and the Hadley Falls Trust Co.

A report to a Boston daily from the Montague Machine Co. of Turners Falls, Mass., states that 1927 was a record year for production of paper mill machinery. During that period, it made and delivered to the Three Rivers mill of the International Paper Co., the largest woodpulp grinder ever made.

We understand that the United Paper Board Co., has filed formal complaints with the Interstate Commerce Commission alleging that the rates on paper board from Thomson, N. Y., to Springfield and Boston switching districts are unreasonable, asking for reparations and reasonable future tariffs. United is becoming more of a factor in New England with the opening of offices at 683 Atlantic Avenue, Boston.

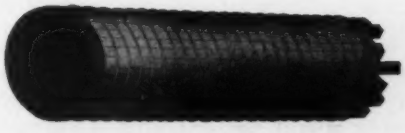
Shipments of paper from New England to points on the Pacific Coast via the intercoastal steamship lines will be stimulated, it is believed, by the proposal of the Conference lines to emulate certain private company lines in accepting less carload freight at carload rates. The railroad principle as between carload and less carload tariff has long obtained in intercoastal commerce via the Panama Canal. It has some-

WOOD TANKS



We manufacture box tanks in a very large number of sizes ranging in capacity from 25 gallons to 30,000 gallons.

We are prepared to build any sort of a wood tank for specific use in paper plants.

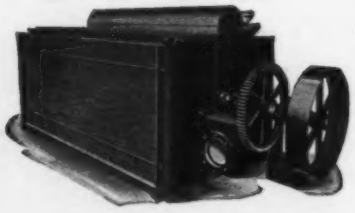


Continuous stave pipe from 18 inch diameter up. Can be made of any wood. We recommend and specialize in Cypress and Redwood since these woods are not affected by soil, corrosion or electrolysis.

Our engineering department will assist and advise you concerning Acid Towers, Stave Pipe and Tanks of all kinds.

The A. T. Stearns Lumber Co.

Neponset **Boston, Mass.**



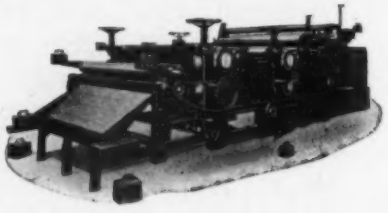
DECKERS

PULP OLD PAPERS

We offer a wide choice in vat design to suit every requirement. This machine in your pulp mill, as a multi-cylinder washer for old magazine or bleached stock, or the special design for handling mixed papers for Boxboard will meet your most exacting specifications.

Our long experience enables us to market these high grade machines at a very reasonable price.

Sizes: 30" x 48" up to 48" x 120"

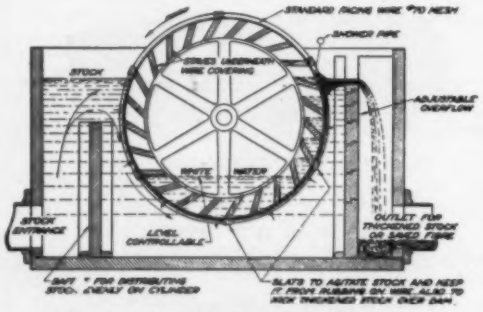


Rogers and Special Wet Machines

The standard machine for producing high density sheet pulp for direct use or for Dryer. A low cost, simple, well proven means for reducing your labor, power and upkeep.

When dry stock is not desired the Single Press will handle the same high capacity with the same labor at still lower cost.

Built in units of 50 tons capacity or less


STANDARD RACINE WIRE 70 MESH
SHOWER PIPE
STOCK
STEEL UNDERNEATH WIRE COVERING
ADJUSTABLE OVERFLOW
WHITE WATER
STOCK ENTRANCE
LEVEL CONTROLLABLE
OUTLET FOR THICKENED STOCK OR BAKED FIBRE
BAFFLE TO DISTRIBUTE STOCK EVENLY ON CYLINDER
BLADES TO AGITATE STOCK AND KEEP IT FROM PLUGGING WIRE ALSO TO KICK THICKENED STOCK OVER DAM

A. D. WOOD Thickener

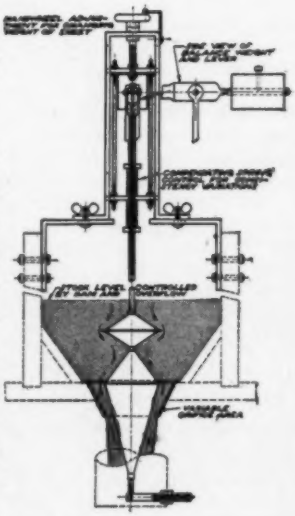
Saveall, Washer, Water Filter

The design of this popular machine is such that the cost per unit of material handled is amazingly low.

The wire does not have to drive and carry a couch roll, nor even help to discharge the thickened stock. Long life results and, with the sturdiness of the remaining parts, makes it almost automatic in operation, so seldom is any attention necessary.

Boivin Weight Regulator

Over 50% of the Boivins now operating were repeat orders.



Capable of handling any clean pulp stock in capacities above 12 tons daily, a trial of this device on our "money-back" guarantee of satisfaction will convince you that the Boivin lowers production cost and makes your customers happy. What more can you ask?

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

Waterous Ltd., Brantford, Ont. — **Manufacturing Agent**

E. K. Mansfield Co., 501 Fifth Ave., N. Y. C.
Eastern Representative

Woodbury & Wheeler Co., 55 Second St., Portland, Ore.
Western Representative

See pages 342 and 343 in the 1927 Paper and Pulp Mill Catalogue

what hindered movement of high grade papers as differences of a cent per pound or more frequently obtained. Objections to the new ratings have been made by interests who would be adversely affected and are now before the Shipping Board.

Formal transfer of the Lyman mills property, the textile plant of Holyoke, to the Whiting Paper Co., was made on February 11th. The textile machinery has been sold and the Whiting Paper Co. will start, as soon as deliveries are made on machinery already ordered, installing new equipment for the manufacture of fine papers. A few machines are scheduled at first but enough are eventually intended to give the mill probably the largest production of strictly fine writings and ledger papers in the world.

Strathmore Paper Co., has been intensively pushing a new line of high grade paper, with all the earmarks of a popular sheet. They call it Artlaid. They believe it answers the needs of high grade yet highly modern printing. It is available in four attractive colors and two weights.

1927 Shows Increase in Boston Pulp Imports

Pulp imports at Boston rose in 1927 over 1926. The total foreign pulp landed at this port, most of it Scandinavian, amounted to 190,000 tons compared to 163,000 tons in 1926, and the fact that the great increase occurred during the later months of the year indicates that the Boston & Maine Railroad's new storage and dockage rates and terms have given an important impetus to the movement. 1928 is expected to show further increases.

The greatest increase was in kraft pulp which went from 49,000 to 63,000 tons, while bleached sulphite advanced from 43,000 to 49,000 and unbleached from 67,000 to 72,000 tons. Exports of paper from Boston dropped sharply last year, however, and all grades shared in the decline except paper bags which increased due to heavy shipments to Cuba.

The Pepperell Card & Paper Co., of East Pepperell, Mass., have opened offices in Boston which will be a sales agency for the New England district. Harry W. Morgan, formerly connected with the Merrimac Paper Co., of Lawrence, Mass., is now associated with the Pepperell Co., and will visit the New England trade, working from the Boston office. H. S. Cashman, who was formerly located at Springfield, Mass., now with the Pepperell company, will also make his headquarters at the Boston office.

Eastern Co. Elects Directors

Prior to the closing of the Boston offices of the Eastern Manufacturing Co., at 80 Federal St., an election of directors was held resulting in the following: Edward M. Graham, president of the company and president of the Bangor Electric Co.; Frank D. True, banker of Portland, Me.; Roland W. Boyden, prominent Boston lawyer; J. W. Farley, another Boston lawyer of prominence; Harold C. Keith, a Brockton shoe manufacturer; W. E. Stanwood, Spencer Trask Co.; George W. Treat, president of E. H. Rollins & Co., and Stuart B. Copeland, general manager of the mill. Albert D. Pomeroy continues as treasurer, F. A. Leahy as vice president. The offices were moved to Bangor on the 16th of February.

Incidentally, Eastern has brought out a new cabinet for its Atlantic bond stationery. It is converted by a Philadelphia firm and is offered in standard sizes for both envelopes and paper.

The appeal of the Byron Weston Co., against the decision of the Federal District Court at Boston, in its suit on hinged ledger paper has been decided adversely and the suit dismissed. The L. L. Brown Co., will, therefore, be free to continue to manufacture hinged ledger paper by its method, which the court has decided does not violate the Weston patents.

The net of the Eastern Mfg. Co., decreased $573,000 last year bringing their working capital down to $1,585,000 from

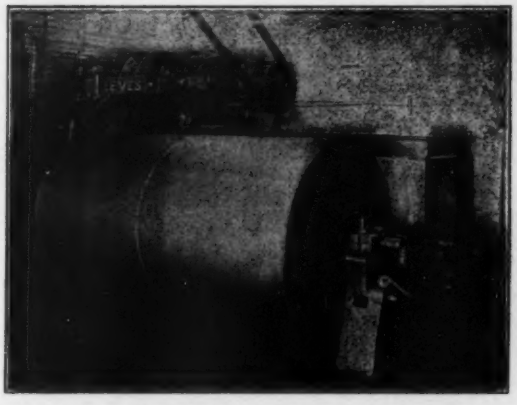


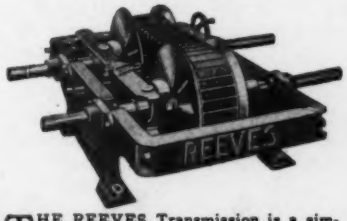
Photo shows a REEVES Transmission operating a Winder at the Cottalap Company, Somerville, N. J.

Eliminate the Torn Sheets in Winding!

IT's easy to reduce the waste in torn sheets on your winders when you have the REEVES Variable Speed Transmission. This simple device regulates the speed of the winder and synchronizes it with the speed of the paper machine so that the speed is changed for each difference in the size of the roll. The REEVES is so accurate and so sensitive that torn sheets are reduced to the minimum.

You should have all the facts about the REEVES. Write for catalog A-88 and full information about its application to Cylinder and Fourdrinier Machines, Cutters, Winders, Slitters, Pasting Machines and many others in your plant.

REEVES PULLEY COMPANY
Established 1887
COLUMBUS, INDIANA



THE REEVES Transmission is a simple, compact mechanical device which receives power at a constant speed and delivers it at any speed desired to any machine or group. It will maintain one set speed indefinitely, or may be changed instantly to meet any different operating condition. Accurate and dependable, always.

REEVES
Variable Speed Transmission

Nova Scotia Mills

Ground Wood Pulp

Prompt carload shipments and excellent service from our distributing points located at

BOSTON, MASS. BALTIMORE, MD. PHILADELPHIA, PA.

NEW YORK, N. Y. and ALBANY, N. Y.

Direct Cargoes to any Atlantic or Great Lakes Port from our Mills

A. P. W. PAPER CO.

MILLS AT
Sheet Harbour, Nova Scotia

SALES OFFICES:
A. P. W. Paper Co.
Pulp Division, Albany, N. Y.

$2,243,000 a year ago. The Atlantic Precision Co., showed a loss for the year of $136,000 due to investment in development work. The investment in development of Alphacel and Estercel pulps also showed a loss for the year, and the company admits the mistake of its investment in the Liberty Paper Co., of Bellows Falls, Vt., which has now been liquidated.

Forester H. Colby Leaves S. D. Warren Co.

H. Colby, head of the Woodlands Department of S. D. Warren Co., Boston, since 1920, has resigned, and after a short vacation will devote his time to the pulpwood and timber interests of the Dead River Timberland Co., of Boston and the timber interests of the J. Manchester Haynes Estate of Augusta, Me.

Mr. Colby has been Chief Forester of Maine, master driver for the Kennebec Log Driving Co., operated for the Great Northern Paper Co., and is an expert whose opinion is sought on timber and land cases involving legal action. He is 59 years of age and has been active in the timber interests of his native state since 17 years of age.

A new method of handling pulp for papermaking through the washing process has been developed at the plant of Crocker Burbank Co., of Fitchburg, Mass. It is being utilized in their mills. The slide washer, as it is called, replaces a method which required several handlings of the pulp. The new washer requires just one handling. A patent for the invention has been secured by the Crocker Burbank interests.

The Boston Paper Trade Ass'n will hold its annual meeting at the Algonquin Club, Boston, on the evening of March 21st. Governor Alvin T. Fuller of Massachusetts will be the guest of honor, and Edward R. Armstrong will discuss "Seadromes," the latest development in aeronautical science.

Freight Ass'n Hears Rate Proposal

New England Paper & Pulp Traffic Ass'n appeared before the New England Freight Ass'n at the latter's hearing on February 20th on the proposed extension of the Boston rate blanket beyond the Massachusetts state line. The paper and pulp association pointed out the necessity of extending this grouping further North than proposed.

The proposal involves common rates on shipments to Southeastern territory via all rail or rail and water through Boston and Savannah and other Southern ports. The paper association also protested the proposed 6th class Southern rating proposed on paper which are two to three times the admittedly high New England Andersen scale. It is probable that the paper interests will come to some satisfactory agreement with the carriers before April 15 which will leave the rates little, if any, higher than at present.

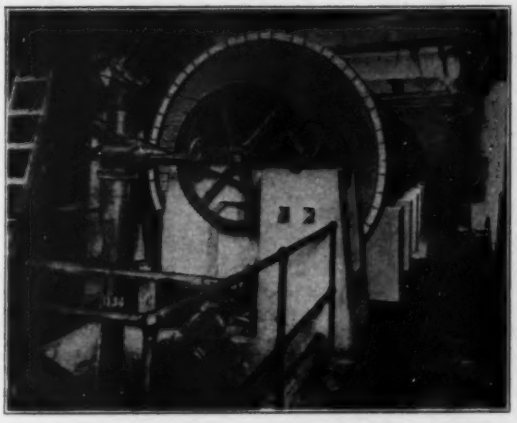
OHIO NEWS

Monthly Meeting of Superintendents

The Miami Valley Division of the Superintendents Association held its regular monthly meeting Saturday evening, February 18, at the Hotel Manchester, Middletown, Ohio. The business session was preceded by a very enjoyable dinner. The regular business of the association was transacted, and R. L. Eminger, National Secretary, reported on the success of the program committee in securing exceptional features for the Spring Convention to be held in Pittsfield, Mass., May 31, June 1 and 2.

Lubrication Test

H. H. Latimer, chairman, spoke briefly with regard to interesting experiments being conducted at the Beckett Paper Co., Hamilton, O. on methods of lubrication. As an example, in a test, they took an instrument reading of power consumed



Just one of Hauser-Stander's successful installations in a well-known Ohio paper mill.

The Right Tank for the Purpose

EACH tank built in the Hauser-Stander shop is a "special job," made to order for a special need. In this way guess work is eliminated. You ***know*** that the tank you order is ***exactly*** what you need for your particular purpose. For this reason also the Hauser-Stander organization is equipped to build any type of wooden tank for any purpose.

A large, up-to-date factory equipped with the most modern machinery and maintained by highly skilled workmen combine to give the greatest economies possible in tank building.

We have a Special Department for the purpose of co-operating with Chemists and Engineers in determining the most suitable materials and construction of tanks for their special needs.

Hauser-Stander has been building wooden tanks for over fifty-five years. The benefits of this experience result in higher grade workmanship at a much lower cost to the customer.

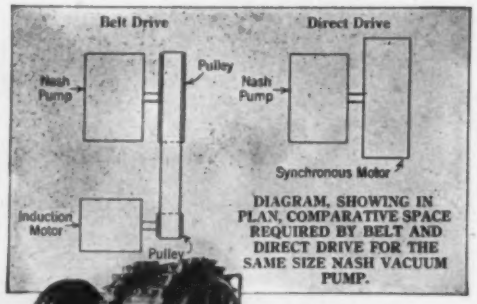
There is quite an interesting story in connection with Hauser-Stander tanks and the work they have been doing in paper mills. May we tell it to you?

The Hauser-Stander Tank Co.

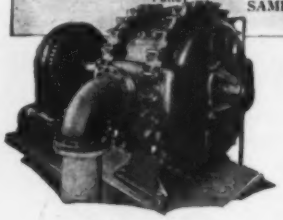
CINCINNATI, OHIO

"We Win with Quality"

Synchronous drive saves floor space



DIAGRAM, SHOWING IN PLAN, COMPARATIVE SPACE REQUIRED BY BELT AND DIRECT DRIVE FOR THE SAME SIZE NASH VACUUM PUMP.



Nash Hytor Vacuum Pump, direct connected to synchronous motor

Just how much, proportionately, it does save, can be determined from the diagram. Here the same size Nash Hytor Vacuum Pump is shown, in one instance, connected by belt drive to an induction motor; in the other, direct-connected to a synchronous motor.

By mounting the pump impeller on the same shaft that carries the rotor of the synchronous motor, a compact arrangement can be provided, making possible an appreciable saving in floor-space.

NASH ENGINEERING COMPANY

So. Norwalk Connecticut

New England Representative
Mr. G. H. Gleason, Nottingham Bldg., Copley Square, Boston, Mass.

Western Representative
Mr. T. H. Savery, Jr., 80 E. Jackson Blvd., Chicago, Ill.

Nash Hytor

VACUUM PUMPS AND COMPRESSORS

"HILL CLUTCH" MILL EQUIPMENT

"CLEVELAND TYPE" OIL FILM BEARINGS

SECTIONAL VIEW
Illustrating the positive oiling system which never fails—that produces almost frictionless oil film. Furnished in all styles of rigid and ball and socket mountings. The split construction of our bearing is an unsurpassed blessing for maintenance men.

Flood lubrication, and nothing else, makes oil film bearings that are capable of steady and continuous service. These qualities are secured only in the "Cleveland Type" Oil Film Bearing.

You should know about them—Ask us

Our "Cleveland Type" Flood Lubricated Bearing has large oil capacity. An automatic pump insures flood lubrication. An oil film develops in the bearing from the moment the shaft starts and continues until it stops. It will automatically carry on under daily operation or continuous twenty-four hour service. It is designed for all kinds of power transmission service—plain or water cooled, and low, medium or high speed.

Wasted power through inefficient bearings, shutdowns and loss of production makes wrinkles in the forehead. Our antidote for lubrication problems is along new and original lines.

You should know about them—Ask us

Catalog giving complete information mailed upon request

The HILL CLUTCH MACHINE & FOUNDRY CO.
Power Transmission Engineers
CLEVELAND, OHIO

RODNEY HUNT

Valves Sluice Gates Floor Stands Screens

Specialized for over 50 years
Catalog No. 32 W. C. A.

Rodney Hunt Machine Co.
38 Lake St. Orange, Mass.

Dependability—Quaker Belts

Quaker Rubber Belts have the strength of pull and freedom from slip essential to efficient power transmission under the hard service of paper mill operation.

They give long use on heavy drives and are unaffected by extremes of heat and moisture.

QUAKER CITY RUBBER COMPANY
Manufacturers of Daniel's P. P. P. Rod Packing
WISSINOMING, PHILADELPHIA
Branches: New York, Chicago, Pittsburgh, San Francisco

by a calender bearing as grooved by the manufacturer. By one particular way of grooving, the power consumption reduction, lubricant saving, etc., amounted to approximately $75.00 in a year's time. Experts are making these studies and have made paper mills their specialty. Mr. Dial, who has charge of the technical school connected with the Vacuum Oil Company, has been secured to address the next meeting of the association March 31, on the subject of "Lubrication." Mr. Dial is highly recommended as an expert on this subject.

Methods Practiced in European Mills

Wm. Fulton, of the Fulton Engineering Co., showed several reels of motion pictures taken on his recent trip to Europe. He also spoke on paper mill methods in the foreign countries. Mr. Fulton observed the economies practiced by the mills, particularly regarding heat losses. It is the practice to double cover all steam pipes with magnesia and go so far as to cover the heads of the machine dryers. Water is piped through breeching in the boiler plant to economically heat water. The dryer faces are polished bright and smooth as glass. It was observed that they do not care to run high speed machines It is very common to see women doing men's work in all occupations. Women shovel coal in the boiler plants, operate machinery and do all heavy work along with the men.

Illustrated Discussion

The subject of "Flow Box Design" was considered in open discussion. The leader provided himself with a large paper chart and as different designs of construction were considered as the best, he would draw the part in the box. First, the shape of the box was discussed, then whether or not it should have baffles, and how many; the location of the piping, etc.

When the drawing was completed, it showed the flow box as designed by the majority. It was generally agreed that it should be somewhat narrower than the breast roll, that there should be baffles, one stationary and one adjustable; the adjustable gate when different weights of paper are run on the same machine.

There was some discussion as to whether the stock should enter at the top of the box or the bottom. The object is to have a quiet flow and it was finally decided that if the piping does not cause the stock to dash in rapidly, it does not make any difference whether it enters at the top or bottom.

Registration

Beckett Paper Co., C. H. R. Johnson, H. H. Latimer, V. Friedrich, Jr.

Champion Coated Paper Co., K. L. Jackson, C. L. McKasson, Raymond A. Steffen, Chas. Soule, R. C. Warder; Crystal Paper Co., Ross Auvil.

Fulton Engineering Co., Wm. Fulton, Sr., Wm. Fulton, Jr., F. L. Shontwiler, G. H. Young.

Gardner & Harvey Paper Co., Edw. H. Butterfield, Frank J. Ditmyer, John Ditmyer, Jr., Walter B. Hadley, Jack Smith, Sr., Jack Smith, Jr.

Hagar Strawboard & Paper Co., A. H. Barlow, J. Lloyd Confarr. Oscar Everhart, Wilson Galloway.

Mead Pulp and Paper Co., Jack Burns, W. H. Cunningham; Midwest Box Co., A. C. Moore, M. D. Moore, Walter L. Potts.

Ohio Paper Co., J. Adam Ritz.

Shartle Bros. Machine Co., H. D. Martindale; Sorg Paper Co., R. H. Smith.

Wardlow-Thomas Paper Co., Tom O'Flynn, E. T. Judd; Wrenn Paper Co., Wm. Goad.

R. L. Eminger, Secretary of National Association.

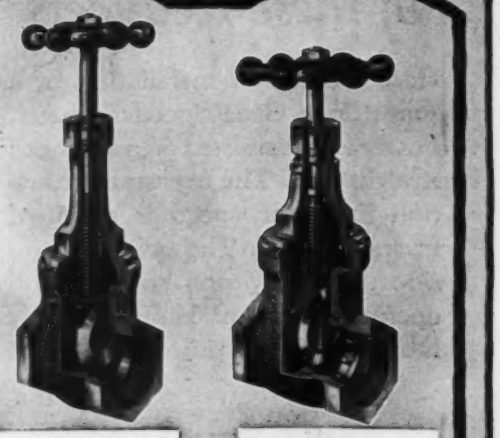
C. W. Shartle in New Paper Mill Project

C. W. Shartle, former president of the Shartle Brothers Machine Co., and secretary of the Middletown Machine Co., is one of the three organizers of the Brown-Bridge Paper Mill at Troy, O. The new company, capitalized at $200,000, is formed by Mr. Shartle, and P. H. Bridge and Herbert S. Brown, both of Troy.

Along with the announcement of the formation of the company came the information that it has purchased all the Hayner Distillery Co. property at Troy. The main plant of the new concern is to be located in a four-story concrete building formerly used as the bottling plant of the distillery.

John Adam Shartle, son of C. W. Shartle, will take an active part in the operation of the plant and expects to remove to Troy for that purpose. Work on the installation of the new factory will start at once and the new plant will be in operation within a short time.

UNFAILING PERFORMANCE
A Built-In Characteristic



Bronze
Double Disc Gate Valve
150 lb. W. S. P.

Bronze
Wedge Disc Gate Valve
200-300 lb. W. S. P.

LUNKENHEIMER
BRONZE
GATE VALVES

have acquired an enviable reputation for long service records.

Just recently, a disc replacement order was received for a Lunkenheimer Bronze Gate Valve which has been in continuous service for over twenty-five years.

No other repairs were required during that extensive period, and the disc renewal made possible many more years of unfailing service.

Unusually long service life is taken as a matter of fact when "Lunkenheimer" is specified, and the satisfaction of the users is exemplified in the constantly increasing number of repeat orders.

Lunkenheimer Distributors are located in all industrial centers, and carry complete stocks. They will fill your requirements promptly.

THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.
NEW YORK CHICAGO BOSTON PITTSBURGH
SAN FRANCISCO NEW ORLEANS
LONDON
EXPORT DEPT 129-135 LAFAYETTE ST., NEW YORK

11012-23-67

Ideal Operating Conditions

are characteristic of these Reducers

Here is a typical installation of a Jones Spur Gear Speed Reducer. Power is transmitted on a balanced straight line. The necessary reduction in motor speed is obtained in small space. The gears are inside the dust-proof housing and operate in an oil bath—perfectly lubricated at all times. Danger of injury to workmen is eliminated. The only attention required is an occasional replenishment of the oil supply. The reducer and motor are mounted on the same base, furnished by us, which insures against misalignment of motor and high speed reducer shaft. Under such ideal conditions it is easy to understand why Jones Spur Gear Speed Reducers transmit maximum power at minimum cost. Write for Catalogue Number 26.

Jones Speed Reducers

W. A. Jones Foundry & Machine Company

Main Offices and Works: 4436 West Roosevelt Road, Chicago

Branch Sales and Engineering Offices:

New York Cleveland Milwaukee Pittsburgh Buffalo Detroit
Birmingham St. Louis Cincinnati Peoria Los Angeles San Francisco

Commercial Forestry[1]

By F. J. SENSENBRENNER
President, Kimberly-Clark Co.

WATER power is the one natural resource which renews itself annually. We may use our water power to the fullest extent and next year we have just as much as we would have had, had we utilized none.

Not so with our forests. When we use a tree, that tree is gone. But fortunately our forests can be renewed. It is the element of time needed which impels us to think once, twice, and many times more, before venturing upon the Herculean task of reforestation.

When we plant trees and try to visualize a forest, it is not even for our children but for our grand-children or great grand-children.

But we must renew our forests. When I say "we", I do not have reference to any particular group of business men, nor any particular association or associations. I mean the people—all the people—the people who use the products of the forest—the people who use lumber and paper, and that means all.

Mr. Milton E. Marcuse in his address before the Natural Resources Industries session on May 4, 1927, said:

> "the Nation should not suffer for lack of wood products, if our citizens can be induced to undertake the growing of trees as a business, and if this undertaking can be begun without delay."

Leaving out of consideration the original cost with the compounding interest charges, the two big drawbacks or problems are fire and taxes.

Can we induce our citizens, as Mr Marcuse suggests, "to undertake the growing of trees as a business"?

There must be a reasonable opportunity for profit, otherwise it would not be a business. In order that the business may hold out hope for profit, the problems of fire and taxes must be solved.

Taxes are a necessity, but unfriendly fires are not. Nevertheless, Fire and Taxes seem to go hand in hand with civilization.

The people—settlers, hunters, and tourists—must be educated along the lines of fire prevention. Much is being done along the educational line, but more should be done. We must work to reduce the fire hazard to the minimum.

The states appreciate the importance of forestry laws, but education will do more to put out a fire at its inception than the most drastic laws. To prohibit the building of a campfire would be as futile as prohibiting the drinking of "fire water."

Where legislation is needed is in easing off on current taxes. Let the business of growing trees pay its just proportion of taxes, but let those taxes be paid out of the business not from year to year as the business is growing, but out of the business when it has materialized.

Industries consuming forest products spread into practically every state in the Union. The people of every state are the ultimate consumers. The nation as a whole is vitally interested in the conservation of our forests. There is no question as to available lands for reforestation. There are millions upon millions of acres suitable for the purpose, but under past conditions lying unproductive—mere wastes.

We can hardly expect the present generation to attempt to bring back the forests for future generations if they must pay additional taxes annually for the privilege.

The Chamber of Commerce of the United States expressed itself on the question of taxing growing trees, in these words,

> "Taxation of growing timber should be based upon the principal of yield tax with reasonable uniformity among the states in such taxation."

Whether the forestry policies as evidenced by the legislation in the states of the past few years will have the desired

[1]Presented at the Eighth Annual Meeting of the Woodlands Section of the American Paper and Pulp Association, Waldorf-Astoria Hotel, New York City, February 23, 1928.

DETROIT FIBRE
MITSCHMADE

Detroit's Products *Stay* Sold

Check up where you will, among our largest users and on down to the smallest, and you will find that Detroit's Products *Stay* Sold.

And little wonder, for since those days way back in the eighties and continuing up to the present time, our efforts have been given to furnishing the highest uniform quality possible.

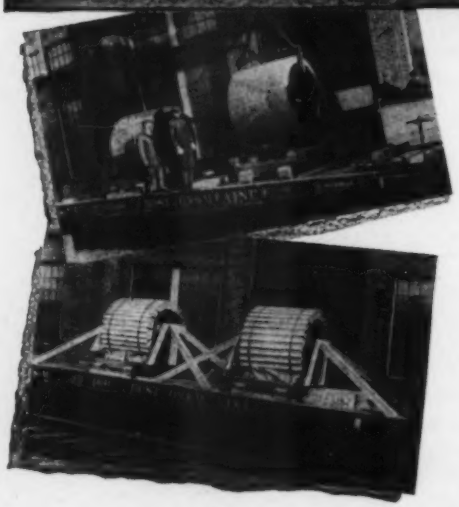
Along with this, it is, as it always has been, the determination of this company to carry into constant practice in all of its dealings, those high principles which have been fostered by the American Paper and Pulp Association and the National Paper Trade Association since their inception many years ago.

The Standard Detroit Line
includes the following well known papers: Swederope Tag—Cordova Super Cover & Bristol — Mitschfolder Tag — Detroit's Die Wiping—Oilskin & Platine Tympan — Japan Manifold — Mitschfibre Parchment—Detroit's M. G. Tissues—Mitschfibre Stripe

"MAKERS OF PAPERS OF STRENGTH"
Detroit Sulphite Pulp & Paper Co.
DETROIT, MICH.

Uniform Stock—

Day in and Day Out



The Norton Pulpstone is a manufactured stone made by the world's largest producer of abrasive products—a stone that is uniform throughout in grit size and in hardness—a stone that produces pulp of a high standard of uniformity.

Norton Company

Worcester, Mass., U. S. A.

Canadian Trade now supplied from Canadian Plant

NORTON
PULP STONES

effect of replacing to some extent our denuded forests, time only will tell.

It may be well that greater inducements will have to be offered before we can hope for concerted action on the part of the present owners of the vast areas of cut-over lands.

An absolutely satisfactory solution of the problem will require much further study and experiment. Conditions peculiar to different localities may require different treatment, but the forestry laws of the different states should be as nearly uniform as practicable, taking local conditions into consideration.

There should not be such discrepancies in the forestry laws as there is between the Michigan Law and the Wisconsin Law as to the "yield tax" as it is called in the Michigan Law, and the "severance tax" as it is called in the Wisconsin Law. Yield tax in Michigan, 25 per cent stumpage value. Severance tax in Wisconsin, 10 per cent stumpage value.

According to the National Lumber Manufacturing Association "More than one hundred and thirty new forestry laws or amendments to prior acts relating to forest taxation, fire protection, and reforestation" were passed in the year 1927 by the Legislatures of forty of the states. But, it is not quantity of laws but quality that counts.

In 1927, the appropriate amendment was adopted to the Wisconsin Constitution, so that the Legislature might pass laws encouraging reforestation. As a result, we have Chapter 454, Laws of 1927, being Chapter 77 of the Wisconsin Statutes. I will quote the opening paragraph of that Chapter.

> "It is the intent of this chapter to encourage a policy of preserving from destruction or premature cutting the remaining forest growth in this state, and of reproducing and growing for the future adequate crops of forest products on lands not more useful for other purposes so that such lands shall continue to furnish recurring forest crops for commercial use, all in a manner which shall not hamper the towns in which such lands lie from receiving their just tax revenue from such lands."

The first part of that paragraph sets forth concisely just what we are working for and the last part explains why complete exemption from current taxation is not accorded to "Forest Crop Lands."

Comparison of Michigan and Wisconsin Laws

I will go more into detail as to the Wisconsin Law, but before doing so I will give the principal features of the Michigan Law.

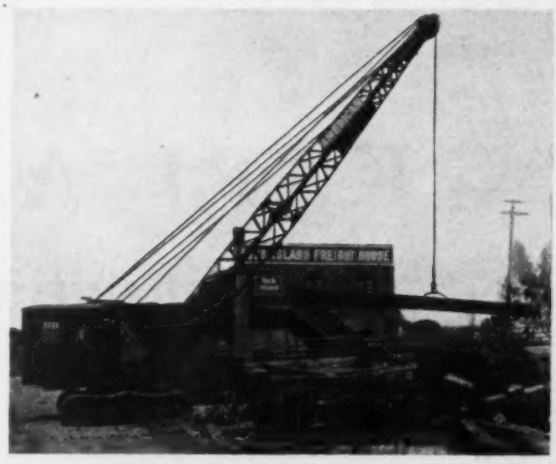
The Michigan Law was originally enacted as Act 94, Public Acts 1925. That Act was amended in 1927, making the specific tax a straight ten cents per acre, whereas the original law had provided for an annual specific tax of five cents per acre on pine lands and ten cents per acre on hardwood lands.

The Michigan Law designates the lands affected as "commercial forest reserves." Application to have lands listed as "commercial forest reserve" must be made to the Department of Conservation. Lands so listed are not thereafter subject to the general property tax. Such lands are thereafter subject to a specific tax of ten cents per acre, payable to the township. An equal amount of ten cents per acre shall be paid by the state treasurer to the county for distribution to the proper townships.

After the timber is cut, the owner must pay a yield tax of 25 per cent of the stumpage value. One-half of the yield tax is retained in the state treasury, the other one-half goes to the county to be distributed in the same manner as the specific annual tax of ten cents per acre.

The Wisconsin Law, being Chapter 77 of the Statutes, designates the lands as "Forest Crop Lands." The minimum acreage which may be listed as "Forest Crop Lands" is one hundred and sixty acres. The adminstrative features of the Law are quite extensive and somewhat complicated.

Petition to have lands listed as "Forest Crop Lands" must be made to the Conservation Commission. The Law requires the Conservation Commission to hold a public hearing on such petition. The Conservation Commission will then determine, upon the evidence submitted at such hearing and on such



"AMERICAN GOPHER" Shovel-Crane—An All-Steel, All-Purpose Machine

The "AMERICAN GOPHER" Shovel-Crane, the all-steel machine with the low up-keep cost, is the very last word in crawler type shovel-cranes, possessing many advantages over machines you may have used in the past.

The following are just a few of the superior features of the "AMERICAN GOPHER" Shovel-Crane.

All heavy duty shafts are chrome steel; heat treated;
All shafting over-size;
SKF Ball Bearings used wherever practicable;
All castings annealed, carbon or alloy steel;
All spur gears above deck have cut teeth;
Fewer parts; less danger of delay;
Parts are interchangeable wherever possible;
Crawler treads, cast chrome steel;
Machinery deck, one large single-piece casting;
High pressure lubrication used all over the machine.

The "AMERICAN GOPHER" Shovel-Crane makes an ideal utility crane for use around industrial plants. Speedy, strong and accurate at all kinds of grab and hook work. Tracks don't mean a thing to it; travels cross-lots anywhere.

Available for a wide range of work.

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Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
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Steel Transmission Towers

RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

independent investigation as it sees fit to make, whether the land offered as "Forest Crop Lands" meets the conditions set out in the law. If the Commission determines that the lands offered do comply with the requirements of the law, it shall enter an order to that effect and thereafter such lands shall be exempt from all taxes except the annual "acreage share" and the Severance Tax.

Section 77.03 provides,

> "The passage of this act, petition by the owner, the making and filing of the order hereinbefore mentioned shall constitute a contract between the state and the owner, running with said lands, for a period of fifty years, * * * * no change in or repeal of this Chapter shall apply to any land then accepted as forest crop lands."

The law makes provision for withdrawal of the lands by the owner.

So long as the lands remain "Forest Crop Lands," the owner is required to pay only the "acreage share" of ten cents per acre annually. The State also pays to each town treasurer the sum of ten cents on each acre of "Forest Crop Lands" in the town.

As to annual taxes paid by the owner, and as to annual amount received by the township, the Wisconsin Law is the same as the Michigan Law.

The Severance Tax is 10 per cent of the stumpage value, which is payable to the state treasurer before March 1 the year following the year of cutting. None of the Severance Tax is paid by the state to the towns.

If the acreage share, that is, the annual tax of ten cents per acre payable by the owner, remains delinquent for three years, title to the property vests in the state.

Payments by the state to the towns of ten cents per acre is dependent upon there being sufficient in the treasury for that purpose. There was appropriated for that purpose available on July 1, 1927, $30,000; on July 1, 1928, $40,000; on July 1, 1929, $50,000; on July 1, 1930, $60,000; on July 1, 1931, $70,000; on July 1, 1932, $80,000; on July 1, 1933, $90,000; on July 1, 1934 and annually thereafter, $100,000.

Under the administrative features of the Wisconsin Law, it lies pretty much with the Conservation Commission to determine whether lands offered are suitable for "Forest Crop Lands." In case of a stampede to enter lands, the Commission would probably act as a balance wheel to keep the acreage down so as not to overrun the funds available to cover the state's share of ten cents per acre.

While I have not made an exhaustive study of the forestry laws of every state, such study as I have made impels me to the conclusion that in its primary features the Wisconsin Law stands well in front.

Under the Wisconsin Law and also under the Michigan Law you can get out your pencil and paper and figure pretty close on how you are coming out at harvest time. You know your first cost and then it is easy to add the flat ten cents per acre per annum with interest. What the stumpage value will be in 1960 or 1970 or 1980, is problematical. I doubt if anyone will predict lower values than we have today. The price of timber must go up unless we are literally flooded with new forests.

Stumpage values will necessarily be practically the same in Michigan and Wisconsin. Yet, the Michigan forests will have to pay a yield tax of 25 per cent, while the Wisconsin forests will pay a severance tax of 10 per cent.

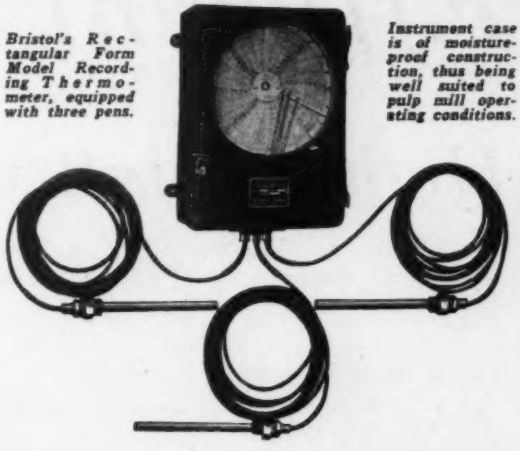
I prefer to plant a forest for my grand-children in Wisconsin rather than in Michigan.

My information is that quite a large acreage has already been entered in Wisconsin as "Forest Crop Lands" although the law was not enacted until July 30, 1927. I also understand that few have taken advantage of the Michigan Law, although the Michigan Law was enacted in 1925.

It makes very little difference to Industry whether the new forests are built up in Wisconsin, in Minnesota, in Michigan, or here. But it will make a big difference to the states.

When the harvest time comes and from then on, year after year, the 10 per cent severance tax will roll into the state

Bristol's Rectangular Form Model Recording Thermometer, equipped with three pens.



Instrument case is of moisture-proof construction, thus being well suited to pulp mill operating conditions.

BRISTOL'S

Three-Pen Recording Thermometer for checking ground pulp Temperature

The recording thermometer illustrated is especially well suited for use where three grinding stones are operated from a single main shafting —or in any instance where stones are relatively close together. When installing, the sensitive bulb is located in the pulp pit below each stone, with the connecting tubing from all three bulbs leading to the recorder. Thus a continuous check on pulp temperature from the three stones is obtained on a single chart.

With such a record for guidance it is comparatively easy to maintain stone speed so as to avoid over heating and burning of pulp. Also, due to the fact that water can be kept at a fairly uniform temperature, there is less danger of stones breaking. Several installations of this model Bristol's Recording Thermometer are operating successfully in large Canadian pulp mills, testifying to the value of such equipment as an aid in controlling pulp quality.

The simple, direct action of the temperature measuring element in Bristol's Thermometers, together with the careful calibration of each instrument, assures continued accuracy and freedom from trouble.

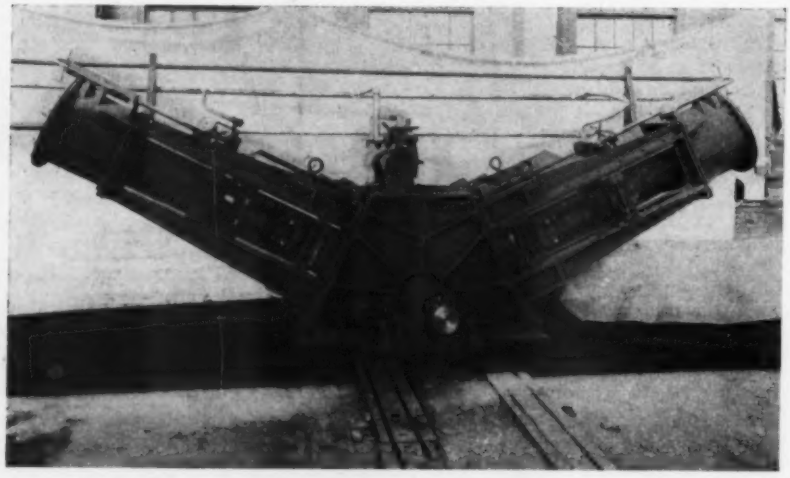
Write for complete information

The Bristol Company

Waterbury, Connecticut

Efficient Machinery for Higher Quality and Lower Costs

The days of plugging along with old, narrow, slow-running paper machines have passed and the paper and pulp makers must now extend this policy of high speed production into all departments of their mills.



"Speed Up Production, Improve Quality, Cut Down Costs," is the slogan that is ringing through all industries as a result of competitive conditions the like of which never before existed in this country.

We have machines which will help you to completely exemplify the aforementioned slogan and we solicit your business, knowing from experience what these machines will do.

Above:

KAMYR CONTINUOUS GRINDER

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Low first and maintenance cost. Very large production. Continuous Hydraulic Grinder with highest efficiency. No extra heavy foundation required.

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KAMYR WET MACHINE

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Up to 100 air dry tons Sulphite or Sulphate or 30 tons groundwood per day produced, 50-60% air dry. Enormous savings in labour, wires, felts, upkeep, floor space, steam, power, etc.

WE ALSO HANDLE:

K. M. B. SLAB CHIPPER

Makes saw mill and box factory waste into good quality chips for pulp at low cost.

K. M. W. ROUND WOOD CHIPPER

Characterized by making chips of very even quality with very small loss of sawdust and inferior chips. Low speed, low power consumption, high production.

G. D. JENSSEN CO.

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For Paper Machinery Ltd., Montreal

treasury—a tax based on the stumpage value of the future. The larger the tax, the better for the state. And what a harvest the other nine parts will make for our grand-children—and the wheels of Industry keep going.

NORTHERN NEW YORK NEWS

Oswego Board Plant Near Completion

The Oswego Board Corporation, which is being erected in Oswego by the Floyd L. Carlisle interests, is rapidly nearing completion and it will be one of the most modern mills of its kind. It is planned to operate the mill on two shifts and possibly three. By a unique system of storage and handling, the insulating board made at the plant during the day can be dried at night when there is less demand for electrical power. The drying is done on eight electric drying machines, designed by the engineers of the board corporation in co-operation with engineers of the General Electric Co.

The dryers have huge flatirons, eight feet long and twelve feet wide, made of solid steel, two and a half inches thick and hollowed in the center to contain the heating element. Each plate weighs more than six tons and consumes more than 146 kilowatt hours, or 300 times the wattage consumed by the ordinary household flatiron. Twenty-one platens will be used in connection with each machine.

More than 4,000 tons of cull wood from the St. Regis Company's system have been received at Oswego and will be used in the manufacture of the board. All of the wood of the St. Regis system which is unfit for the making of catalogue and newsprint is shipped to Oswego to be used in making the insulating board. In addition, sulphite and ground wood screenings, valueless for paper making, but representing a considerable amount of money will go into the new product.

Richard A. Kirk of Trenton, N. J., has arrived in Oswego to organize the operating force in connection with the Oswego Board Corporation. He will remain as plant manager until the industry is in operation. Day and night forces are at work in constructing both the board plant and the Taggart bag plant. The bag plant is already manufacturing bags from kraft paper furnished by the Champion mill of the St. Regis group, but will soon be manufacturing its own paper.

As both factories are outside the corporate limits of Oswego an elaborate fire fighting system has been installed by the company, connected with the Oswego water system.

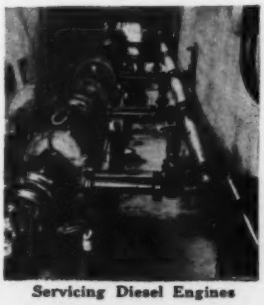
T. H. Hammond, president and general manager of the Hammond Bag and Paper Co., Wellsburg, W. Va., formerly of the Taggart Brothers in Watertown, believes that the outlook for the paper industry in 1928 is particularly bright. The consumption of paper bags is increasing yearly, and this is due to the wonderful improvement in quality of paper bags manufactured today in comparison with those made a few years ago. Many uses are being found for the paper bags which are replacing the cloth bags and other old style bags.

Ralph Odell Spencer of Watertown, superintendent of the Taggart Brothers mill at Herrings, has gone to Wellsburg, W. Va., to accept a position with the International Paper Co. Mr. Spencer, who is but 25 years old, is one of the youngest paper mill executives in the country. He began his business career, after graduating from the local high school, as a clerk in the New York Central freight office. After two years in outside commercial work, he entered the employ of the Taggart Brothers Co. He was made assistant superintendent of the local mill within two years. He took a Y. M. C. A. course in accounting and a correspondence course in business administration, and was then promoted to manager of the Herring mill.

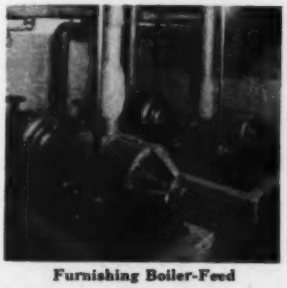
The greater part of the new papermaking machine being manufactured by the Bagley & Sewall Co. for the Great Lakes Pulp and Paper Co., Minneapolis, has been shipped. The machine is to be installed in a new mill of the company at Fort William, Ont., opposite Port Arthur. The machine is

AMERICAN-MARSH PUMPS

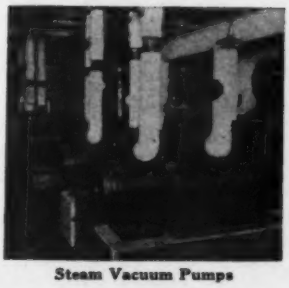
Confidence



Servicing Diesel Engines



Furnishing Boiler-Feed



Steam Vacuum Pumps

Bilge Pump for Drainage

THROUGH the years — over forty now — American-Marsh pumping equipment for every conceivable paper mill application has enjoyed the confidence of its users.

It is equipment designed and built by a leader in the industry—by an organization whose entire energies and resources are directed toward the perfection of this one product—*pumps*. And whose personnel and plant facilities are adequate to meet the most exacting requirements.

When you select American-Marsh pumps you are in line to receive as fine equipment as is produced, plus engineering ability seasoned by wide practical experience.

May we help you with your next pumping problem? Write for our Bulletins. Better still, have our engineers submit a specific recommendation covering your needs. We manufacture a complete line—both steam and centrifugal pumps.

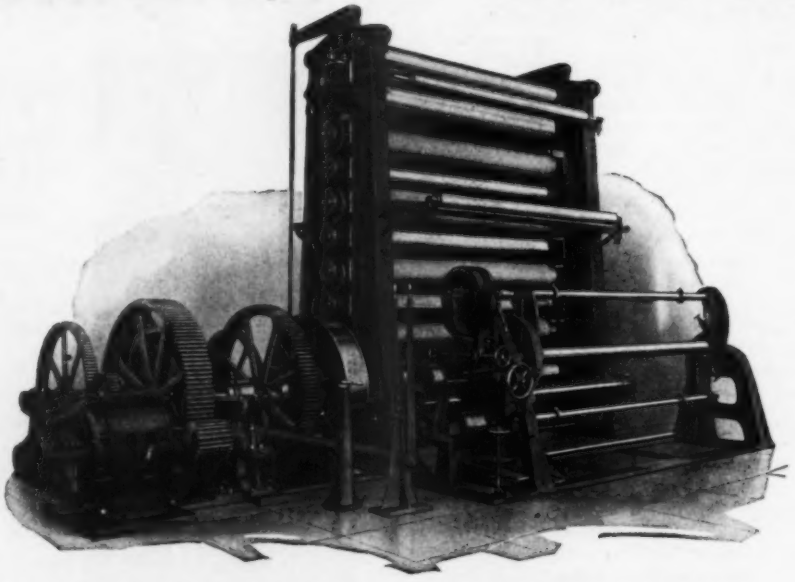
AMERICAN-MARSH

AMERICAN STEAM PUMP COMPANY

BATTLE CREEK, MICHIGAN

PUMPING EQUIPMENT

HOLYOKE



PRECISION

HOLYOKE Precision is really the result of continuous contact for 65 years with the big-and-little problems of the mill. To analyze exactly the special needs of the paper maker and to build *precisely* to his requirements,—that is the basis of HOLYOKE Service.

HOLYOKE invites you to consult with their Engineers when planning the purchase of Paper Mill or Wood Pulp Mill equipment. It pays to buy that extra percentage of experience with every dollar you spend.

Write HOLYOKE MACHINE COMPANY, HOLYOKE, MASS., Manufacturers of Super Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

264 inches wide and nearly approaches the 270-inch machine in the Gatineau mill. It has a speed of 1,200 feet a minute. Forty-eight 60-inch dryers weighed 13 tons each. The machine will be installed by Richard Gray of the Bagley & Sewall plant.

The International Paper Co. has installed a large cutter in its Pyrites mill and will produce a large quantity of sheet paper in the future. It is said this is caused by the demand of the country weekly newspaper which use a flat bed press and find it hard to secure sheet paper from the up-state mills. A modern first-aid room has been completed and a nurse will be on duty. She will also render assistance to families of the employees.

C. W. Valentine has been re-elected president of the Bagley & Sewall Co. Other officers re-elected are: Edward S. Lansing, vice president; Clarence E. Kinne, vice president; Charles D. Bingham, treasurer; Carroll L. Thompson, secretary and assistant treasurer.

Reconstruction of Fort Edward Mill Completed

Work on the reconstruction of the Fort Edward, N. Y. mill of International Paper Co. has been completed and the mill is now equipped to make special bleached papers. The mill has six machines of a capacity of 130 tons of book paper a day.

The mill is on the Hudson River, about fifty miles above Albany and is also on the feeder terminal of the New York State Barge Canal. It is thus well located for securing its raw materials and the shipment of its product.

Practically all the buildings and equipment have been overhauled, and in addition there have been built a new boiler-house, a hydro-electric plant, additional finishing rooms with super-calenders, a new beater-room, and a bleach plant. The paper machines have been overhauled, and the three machine rooms have been rebuilt. With the exception of the turbines driving the paper machines, the entire mill is now electrically driven.

A. W. Bronk, Gen. Supt. of St. Regis Group

A. W. Bronk, superintendent of the St. Regis Paper Co. of the St. Regis syndicate, has been appointed general superintendent of the entire kraft division of the St. Regis group, comprising the Champion, Herrings and Oswego mills. Fred Kruse, superintendent of the Taggart Oswego Bag and Paper Corp., in charge of the paper department, has resigned. No successor has been appointed. Mr. Bronk came to the St. Regis group from the Warren Thompson company of Bellows Falls, Vt. The Oswego plant of the Taggart company will be in operation with all equipment running at capacity April 1. The paper department will be operated with three shifts on a 24 hour basis and about 150 hands will be employed. The bag department will employ 150. General Manager Corwin T. Jewell announces that the machines of the Herring mill will be changed from cylinder to fourdrinier just as soon as the new equipment can be built.

John Garso, yard foreman of the Algonquin paper mill, Ogdensburg, was killed as the result of falling from the conveyor of the plant. He was 55 years old, and had been employed by the Algonquin Corporation four years.

Warren Manufacturing Co. Makes Improvements

The Milford, N. J. plant of the Warren Manufacturing Co. has been improved to increase its output of Reigel's Glassine Paper. This company is one of the largest manufacturers of glassine in the United States. The Milford plant previously continued four paper machines, all devoted to the manufacture of glassine. The enlargement provides a fifth machine in a new machine room large enough to house a sixth machine as well.

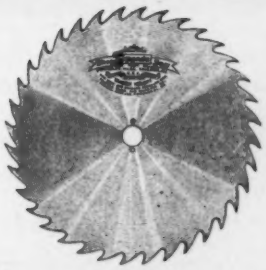
This company manufactures at its Warren, Hughesville and Riegelsville plants, Riegel's Rope and Jute Papers, a wide variety of specialties used largely for industrial purposes.

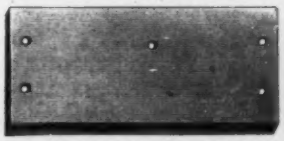
DEPENDABLE DURABLE

BUNDLING PRESSES
NAPKIN FOLDERS
PRINTING DEVICES
Towel Interfolding Machines
Paper Converting Machine Co.
Green Bay, Wis.

SIMONDS

Circular Saws and Machine Knives



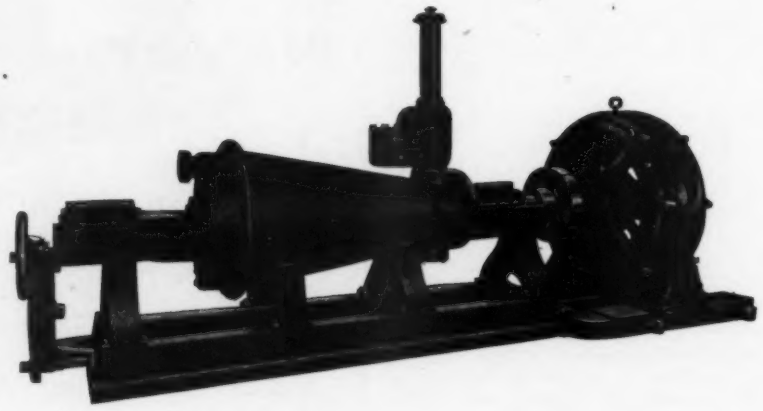


For pulp and paper mills it is economy to use Simonds Saws and Barker, Chipper and Paper Cutter Knives because they hold their edge longer and cut faster. They are backed by a near century of experience. Write for catalogue and prices.

Simonds Saw and Steel Co.
Established 1832
Fitchburg, Mass.
Boston Chicago

It takes years—

to develop a Jordan like this



It takes years—many years—of careful effort, of painstaking investigation and research to develop a Jordan like the Jones. It takes skilled engineers and workmen who are constantly on the alert for new methods and devices for improving the machine.

The results of these years of effort are evident in the Jones Jordan. They are evident in the smooth, well-balanced operation, in its long life in the paper mill, and the ease of adjustment for refining.

The Jones Jordan is being used today, and has been used for years, in producing practically all grades of paper.

For the highest production with the lowest maintenance and operating costs, the Jones is the choice of paper makers.

Motor or Belt Driven **Six Sizes:**

Laboratory - Pony - Standard - Imperial - Majestic - Leviathan

E. D. Jones & Sons Co.

Pittsfield, Mass.

NEW YORK CITY NEWS

Wood Pulp Importers Elect Officers

Orval A. Wales, of Johaneson, Wales & Sparre, Inc., New York, was elected president of the Association of American Wood Pulp Importers at the annual meeting of that organization at the Uptown Club in New York on February 2. Mr. Wales, who has served the association as vice president and as secretary, succeeds Hans Lagerloef, of the Lagerloef Trading Co., Inc., of New York, who headed the association for the past two years, as president. Stanley C. Willey, of Atterbury Bros., Inc., was elected vice-president, succeeding Mr. Wales, and William H. Anders, of the Perkins-Goodwin Co. was re-elected treasurer. Edwin B. Erichson, of Pagel, Horton & Company, Inc., was elected secretary, succeeding Mr. Willey. The newly elected officers will serve during the ensuing year.

The above officers, together with Fred Enders, of Bulkley, Dunton & Co., compose the Board of Directors of the association. Howard E. Atterbury, of Atterbury Bros., Inc., was re-elected National Councillor, and J. A. Millar, of the Scandinavian Pulp Agency, Inc., was again chosen Substitute National Councillor.

Barrett Company Sells Mill

The Barrett Company, whose head offices are in New York City, has sold its roofing felt mill in Latrobe, Pa., through the Gibbs-Brower Co., Inc., paper and pulp mill brokers, to the American Industrial Co., of 342 Madison Ave., New York, together with Pittsburgh banking interests. A new company known as the Latrobe Paperboard Company, with general offices in Latrobe, has been formed to operate the mill which has been converted into a box board manufacturing plant. Officers of the new company are F. B. Oldham, president and general manager; Chauncey M. Smith, treasurer, and F. B. Oldham, Frank D. Sinclair and Chauncey M. Smith, directors.

The mill has begun operations under the new ownership, and is producing lightweight chip board and specialties. It is regarded as a very fine mill property and one which is complete in every way and with an advantageous location. The Barrett Company purchased it from the old Peters Company a number of years ago.

Amos P. Hawley

Amos P. Hawley, widely known in the paper trade, died in the Hotel Belmont in New York City on February 19 following a brief illness.

For many years Mr. Hawley was purchasing agent for the Boerum & Peese Blank Book Co., New York, until he resigned to accept the managership of the Geo. O Gill Division of the American Writing Paper Co. Following this mill experience, he together with William H. Holden, formed the fine paper jobbing concern of Holden & Hawley, Inc., in New York City, which operated for several years. About a year ago this company was absorbed by George W. Millar & Co., Inc., being made the nucleus of a fine paper department of the old established Millar organization, wrapping paper merchants. Mr. Hawley retired from the company and since has been purchasing agent for the New York Stock Exchange.

Funeral services were held on February 21 in the chapel of Greenwood Cemetery, where interment took place. Mr. Hawley is survived by a widow.

The Columbia Corrugated Co., one of the largest concerns in New York City dealing in corrugated paper and products, with offices and plant at 270 Eleventh avenue, New York, has purchased the immense Long Island Air Reserve Depot property in Long Island City, and will move to the new location shortly. The property, which brought $963,750 and which was obtained by the U. S. Army during the world war from the General Vehicle Co. includes twelve buildings on a parcel

Never Shut Down!

Many paper mills are operated continuously night and day to get the maximum tonnage and profit.

The investment in a single Fourdrinier machine with buildings and equipment amounts to hundreds of thousands of dollars and every shutdown means a big loss to the mill.

Nowhere is it more essential to keep going—nowhere is it more important to have equipment which can be depended upon to give long service.

That's why hundreds of paper mill superintendents specify Tyler Fourdrinier Wires. They have learned to depend upon the long and satisfactory service which these wires give. They know that their Fourdrinier machines can be operated for longer, continuous runs without wire repairs or replacements.

Tyler Fourdrinier Wires run straight and true. The firm weaving and the full, double crimp assures long, dependable service without dveloping slack edges or baggy spots in the wire.

Supplied in all widths up to and including 250 inches

The W. S. TYLER COMPANY, *Cleveland, O.*

Backing Wire Tyler Fourdrinier Wire Corduroy Cloth

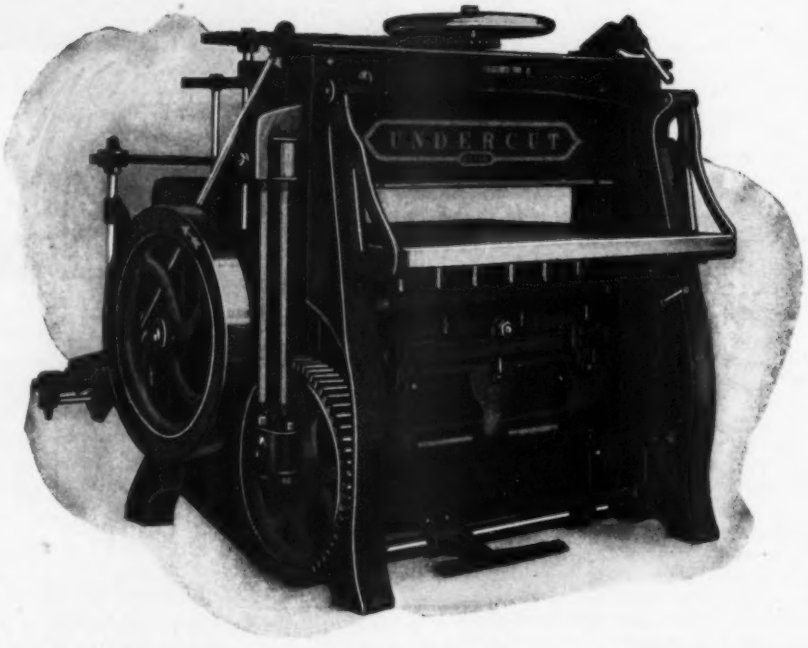
TYLER WIRES

ESTABLISHED 1828

The

Smith & Winchester Mfg. Co.

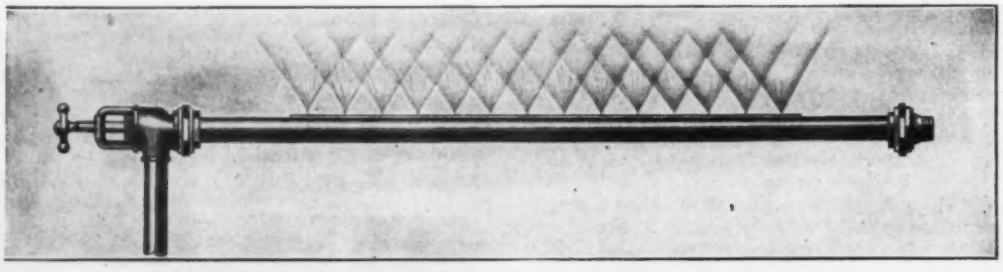
South Windham, Connecticut



THE UNDERCUT PAPER MILL TRIMMER

PAPER MAKING MACHINERY

FOURDRINIER AND CYLINDER MACHINES—PUMPS—JORDAN ENGINES



THE RAINSTORM SHOWER PIPE

PAPER BAG MAKING MACHINERY

of 6.7 acres, and is bounded by Borden, Review and Bradley Avenues and Fox and Gilbert Streets.

The Tidewater Paperboard Co. operating a box board mill in Norwich, Conn., has arranged for an increase in capital by an amount of $100,000 preferred stock, making a total outstanding capital stock of $400,000.

The R. T. Vanderbilt Co. suppliers of clay to paper mills, of 50 East Forty-second St., New York, has leased more than half of the seventeenth floor in the tower of the new thirty-five story New York Central Building now being erected on Park Avenue between Forty-fifth and Forty-sixth Sts., and will move to its new offices as soon as the building is ready for occupancy.

The Mead Paper Board Corporation has been incorporated under Delaware laws with a capital of $5,000,000 preferred stock and 100,000 shares of no par common stock to manufacture paper, paper board and products. The Sylva Paper Board Company also has been incorporated in Delaware with a capital of $1,360,000 preferred and 20,000 shares of no par common stock to manufacture pulp and paper board and products.

The Woodpulp Service Corp., of 250 Park Ave., New York, has made arrangements with C. Fr. Bennet, of Stockholm, Sweden, to represent it in Scandinavia as a source of wood pulp for sale in the United States. Mr. Bennet is allied with Bulow Bennet & Co., of Paris, France, one of the leading wood pulp concerns on the European Continent.

George O. Meyer, well known in paper stock circles through his association with several concerns, is now in charge of the paper mill supplies department of the Walker, Goulard, Plehn Co., Inc., paper merchants and paper stock dealers of 448 Pearl St., New York, who, incidentally, are successors to the Maurice O'Meara Co.

The Gotham Tissue Corp., of New York City, dealer in and converter of tissue paper, has filed notice of an increase in its capital stock from $30,000 to $81,000 to provide for contemplated expansion.

The Sterling Mill Supply Co., Inc., dealer in all kinds of papermaking materials, has removed its offices from the Italian Savings Bank Bldg., 27 Cleveland Place, to a warehouse which the company has taken over at 177 South St., corner of Roosevelt St., New York. The addition of this warehouse brings the total number of packing plants which the Sterling Company operates in New York to five, and gives it an estimated output of more than 200 tons of waste paper and rag stock per day.

BRITISH CORRESPONDENCE

Consumption of Paper Increasing

Board of Trade statistics for 1927 indicate that the consumption of paper in this country is on the increase, a large proportion of the increased demand has, however, been met by foreign imports. The total figure for the year of imports of raw materials for paper making was 1,748,000 tons, an increase of 150,000 tons on 1926. The probable output of British mills is considered to be somewhere near 1,160,000 tons, about 40,00 tons more than in 1926. Increases were shown in every item of imports except wrappings, the drop in which was caused by the imposition of a duty.

On the other hand, our exports have decreased to 216,000 tons, 20,500 tons less than last year.

The position in the newsprint section is satisfactory. Although the preferential tariff, formerly enjoyed by Great Britain alone in the Australian market, has been extended to

Cut down costly shut-downs!

LONG, costly shut-downs attributable to slow, tedious, cleaning practices are unnecessary.

For efficient Oakite methods reduce cleaning time to an absolute minimum! Oakite materials speed washing and rinsing of felts; eliminate much hand brushing of wires; save effort in cleaning cylinder rolls, screens and screen plates. In fact, this better, easier way to clean makes every minute count to the utmost on every cleaning job in the paper mill.

A card to us puts the help of our Service Man at your disposal. Write for him to call or for further interesting particulars. No obligation.

Oakite is manufactured only by
OAKITE PRODUCTS, INC., 16A Thames St., NEW YORK, N. Y.

Oakite Service Men, cleaning specialists, are located at

Albany, N. Y., Allentown Pa., Altoona, Pa., *Atlanta, Baltimore, *Birmingham, Ala., *Boston, Bridgeport, *Brooklyn, Buffalo, *Camden, N. J., Charlotte, N. C., Chattanooga Tenn., *Chicago, *Cincinnati, *Cleveland, *Columbus, O., *Dallas, *Davenport, *Dayton, O., Decatur, Ill., *Denver, *Des Moines, *Detroit, Erie, Pa., Flint, Mich., Fresno, Cal., *Grand Rapids, Mich., Greenville, S. C., Harrisburg, Pa., Hartford, *Houston, Tex., *Indianapolis, *Jacksonville, Fla., *Kansas City *Los Angeles, Louisville, Ky., *Memphis, Tenn., *Milwaukee, *Minneapolis, *Moline, Ill., *Montreal, Newark, N. J., Newburgh, N. Y., New Haven, *New York, *Oakland, Cal., Omaha, Neb., *Philadelphia, *Pittsburgh, Portland, Me., *Portland, Ore., Providence, Reading, Pa., *Rochester, N. Y., Rockford, Ill., *Rock Island, *San Francisco, *Seattle, *St. Louis, *St. Paul, South Bend, Ind., Syracuse, N. Y., *Toledo, *Toronto, Trenton, *Tulsa, Okla., Utica, N. Y., *Vancouver, B. C., Williamsport, Pa., Worcester, Mass.

*Stocks of Oakite materials are carried in these cities.

OAKITE

TRADE MARK REG U.S. PAT. OFF.

Industrial Cleaning Materials and Methods

Paper Makers Felts and Jackets

Highest Quality Only

"They Satisfy"

THE WATERBURY FELT COMPANY

SKANEATELES FALLS, N. Y.

Canada, we have competed fairly successfully with Canadian mills, our exports to that country decreasing by only 5,000 tons. 70,825 tons of newsprint was imported last year in advance of the 1926 total of 242,224 tons. The production of wrapping paper has grown in volume. The demand for high-class writings is also improving and the increasing number of magazines is leading to an expansion of the section devoted to the production of imitation art.

Inveresk Paper Co. Ltd. Development

Highly satisfactory reports are to hand in regard to the year's workings of the group of mills under the control of the Inveresk Paper Co., Ltd. Each one of them has shown a substantial profit, and even the recently added mills have shown an increase in this respect. The policy adopted by this concern has been to remodel, improve, and modernize in every way possible. Smaller and older machines are being scrapped, and replaced by up-to-date ones of greater width and capacity.

A special development under the aegis of this combine is in the direction of the manufacture of pure vegetable parchment. This constitutes the first serious attempt to produce this material in England. In the new mills built for the purpose are housed four of the most up-to-date parchmentizing machines, each capable of dealing with 50 tons of paper per week, and already one of them has started work. It is claimed that the paper produced is quite equal to if not better than the best of that which is being imported. In view of this development production, the foreign makers have dropped their selling prices about £6 below what had been their fixed price for many years.

William Harrison, chairman of the company, who presided at the fifth annual general meeting held recently, pointed out that a million and a half pounds had been spent in bringing the mills under the company's control up to a high state of efficiency. He said: "For many years past, it has been a point of criticism by American industrial magnates, that in the Old Country we work an antiquated plant until it falls to pieces of old age, while the enterprizing Yankee regularly scraps obsolescent machinery long before it has a chance to become obsolete. It may be possible to carry either policy to an extreme; but to your directors at least it seems right and wise to install the most efficient, economical, and labour-saving machinery procurable, because they are convinced that in the keen competition which is coming along in the paper making industry only those mills which can produce the highest grade products at bed-rock prices can hope to survive. We believe that when our reconstruction scheme is complete we shall be in a position to meet competition from whatever quarter it may come."

Exports to the United States

Discussing the United States market, recently, an expert in the trade has pointed out that America has, of necessity to import enormous quantities of paper and stationery to supplement the enormous output of her mills and factories, and, in view of this, he considers that it would be unreasonable to suppose that Great Britain has reached the limit of possible achievement in this market. He pointed out that, apart from Canada, which is the chief supplier, France, Germany, Sweden, and Finland each control a larger portion of the United States trade than Great Britain. He said: "British manufacturers should, if sufficient effort be made, be well able to increase their sales of all classes of high-quality papers; but the best prospects appear to exist in connection with bond, ledger, book, and other light weight papers for the printing trade, writing paper in large sheets, and paper hangings. British manufacturers exporting to the United States should not overlook the opportunities afforded by the Western States and Pacific Coast, and where possible advantage should be taken of the cheaper water rate to ship goods direct to coastal districts. Although New York importers of paper and stationery serve the whole of the American territory, United Kingdom firms might usefully consider the advisability of obtaining separate representation in the west."

An excellent 40-page supplement devoted to British Paper Making was issued by the Manchester Guardian Commercial

RHOADS TANNATE WATERSHED LEATHER BELTING

Why Tannate Is Economical

ONE paper man ordering a $1,000 Tannate Belt offered as his reason the fact that he felt it would last longer than rubber or oak belting. And added, "If the plant is stopped for two or three hours it will cost us $1,000 and disorganize the whole place."

Stops for shortening or the replacement of belts can be expensive. The saving of a few such stops may go a long way toward paying for a Rhoads Tannate Watershed Belt.

Add to this saving the results obtained from the stronger grip of Tannate and you may see why so much Tannate Watershed Belting is going into paper mills.

With Tannate Belting you buy Rhoads Guaranteed Belt service. May we send you our Tannate Booklet giving the Rhoads Service Guarantee?

J. E. RHOADS & SONS

PHILADELPHIA .....47 N. Sixth St.
NEW YORK .....112 Beekman St.
CHICAGO .....334 W. Randolph St.
ATLANTA .....80 South Forsyth St.
CLEVELAND .....1234 W. Ninth St.

Factory and Tannery, Wilmington, Del.

ROEPER ELECTRIC HOISTS

As Strong as Twenty Men
As Accurate as One

When you pull on the cord the ROEPER TYPE "R" Electric Hoist goes to work with the strength of twenty men, right under your guidance. Unsurpassed for handling paper rolls, calender rolls or other heavy lifting.

SEND FOR BULLETIN

ROEPER CRANE & HOIST WORKS, Inc.
1724 North 10th Street READING, PA.

FOR SALE

One excellent 90" trim Rice, Barton and Fales Paper Machine complete with Marshall Drive; three 10 plate screens, wire 60' x 106"; two sets Presses; 24-48" diameter Dryers; two Stacks Calenders; Reel; Winder —complete in A-1 condition. Immediate delivery. Also Brownell Variable Speed Engine with Paper Machine. Also three 2,000 lb. Jones Cypress Wood Tub Beaters. Good condition. Full details and photographs upon request. All at very reasonable price.

GIBBS-BROWER COMPANY, INC.

Paper and Pulp Mill Brokers

261 Broadway, New York City
168 West Jackson St., Chicago, Illinois
1816 Engineers Bank Building, Cleveland, Ohio
Woodbury & Wheeler Co., Western Representatives
55 Second St., Portland, Oregon
OUR MOTTO—"Service First."

— FOR SALE —

MODERN PAPER MILL EQUIPMENT COMPLETE
- USED ONE MONTH -

FOURDRINIER PAPER MACHINE

Wire 96"x65'-0", three presses, twenty-nine dryers, two stacks calenders, two bowl reel, double drum winder and Marshall Drives.

Three 1200 lb. beaters, two large jordans, screens, stuff pumps, agitators, line shafting complete with pulleys and bearings.

PRICE RIGHT FOR QUICK SALE.

Address: Box 135
THE PAPER INDUSTRY

It Pays to Advertise Opportunities in this Opportunity Section

AGENCIES WANTED

A Sales Corporation in Montreal, Que., doing business with the Pulp & Paper mills only throughout the Dominion of Canada, can handle two or three more lines used by the Pulp & Paper trade.

Apply giving full particulars to

BOX 136

THE PAPER INDUSTRY,

PAPER MILL MACHINERY

One 72" Pusey-Jones Fourdrinier Part. Takes wire 74" by 50 ft.

One 129" Hamblet duplex sheet cutter with layboy and six roll stand.

One 134" Pusey & Jones Uniform speed reel.

One 130" Moore & White four drum winder with slitter attachment.

Three Beloit triplex stuff pumps 10x20.

Two Pulp breakers, Noble & Wood, 1200 lbs.

Four beaters, Horne, 54" x 48" with wood tubs.

All above equipment in excellent condition, installed new in 1923.

51 Dryers 36" x 72" with frames, felt equipment.

One reel, two drum upright.

One 68" duplex sheet cutter, Downingtown.

One 72" Moore & White four drum winder.

Three Dayton beater rolls 66" x 60".

Two 72" Baker wet machines.

Two 3 pocket grinders with sones 54" x 27" direct connected to G. E. motor, 2200 volts, 60 cycles, 240 r.p.m.

For Sale By

FRANK H. DAVIS COMPANY

175 Richdale Avenue, Cambridge, Mass.

POSITION WANTED: Superintendent with over 25 years experience desires position where ability will be appreciated. I am accustomed to making high grade paper to the most rigid specifications using Manila rope including tarred, graphite and oily, Jute, cotton and kraft, straight and in combination. Can handle men and get results. Address Box 137, The Paper Industry.

Ham Feltz sez:

"Noah Webster invented about 250,000 words to put in his dictionary but he didn't invent any as will tell about the way Hamilton Felts suck out the water like a Jersey mosquito sucks blood, go easy on the coal pile, speed up the output, and pile up the profits that make it easy for the boss to get along with the stockholders. You've got to experience that for yourself."

Hamilton Felts

last week (February 16th), in which various aspects of the British papermaking industry are surveyed from the point of view of those engaged in the trade, and to which leaders in the trade contribute articles of practical and technical value. The Secretary of the Paper Makers' Association of Great Britain and Ireland writes on the various trade organizations, and other matters dealt with are Problems of Standardization; Machines and Men; Research; and Wood Pulp.

Import and Export Figures

The following are the values and quantities of paper and papermaking raw materials imported and exported during January:

IMPORTS

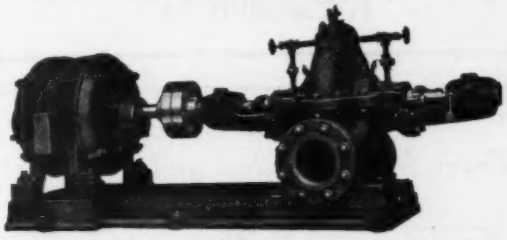
	January, 1928.	Inc. (+) or Dec. (—) as compared with 1927.	as compared with 1926.
Values:			
Paper-making Materials..	902,079	—406,552	—115,052
Paper and Cardboard....	1,308,061	—20,112	+97,292
	Jan., 1926.	Jan., 1927.	Jan., 1928
Quantities:			
Paper, cwt.	1,185,972	1,365,021	1,312,420
Wood pulp, tons	99,888	134,713	88,869

EXPORTS

	January, 1928.	Inc. (+) or Dec. (—) as compared with 1927.	as compared with 1926.
Values:			
Paper-making Materials.	124,859	+36,536	—1,860
Paper and Cardboard....	771,818	—10,361	+15,496
	Jan., 1926.	Jan., 1927.	Jan., 1928
Quantities:			
Paper-making Materials, tons	11,348	9,939	16,327
Paper & Cardboard,cwt.....	354,299	377,323	374,516

LAWRENCE CENTRIFUGAL "Vortex" PUMPS

Excellent in design, developed by pump specialists, and built of best materials in a factory which builds Centrifugal Pumps exclusively. They must be good. More than 150 pumps sold to a single mill.



Ask about our new Stock Pump, with non clogging impellers. New Water Supply Pumps, Ball Bearing type. When writing for our latest bulletins please be particular and address us at P. O. Box 70.

Lawrence Pump & Engine Co.

P. O. BOX 70,
LAWRENCE, MASS.

POWELL VALVES

The Powell Irenew Valve is a truly economical Iron Body Valve with regrindable and renewable seat and disc of hard Powellium nickel bronze.

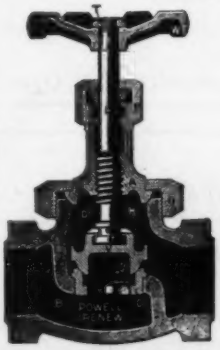


Fig. 190
Irenew Globe Valve

Powell Irenew Valves are designed with bronze union bonnet and spindle, and heavy grey iron body, or may be obtained with iron trimmings. All parts are accurately processed. Irenew Valves are obtainable in globe, angle, cross, and check patterns for 150 pounds, and extra heavy for 250 pounds W.S.P. Sizes ¼ to 3 inch.

If your jobber does not stock Powell Irenew Valves, write us for nearest source of supply.

Circular on request.

THE WM. POWELL CO.

2521-2531 SPRING GROVE AVE., CINCINNATI, OHIO

Some of the largest paper mills in the country have switched to Butterworth Calender Rolls.

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

Plants at Philadelphia and Bethayres, Pa.

Canadian Representative: W. J. Westaway Company, Hamilton, Ontario, Can.

Providence Office: Turks Head Building

Southern Office: 1211 Johnston Bldg., Charlotte, N. C.

Butterworth Calender Rolls

POWER PLANTS

Complete Service

Design

Construction

THE RUST ENGINEERING CO.

PITTSBURGH, PA.

James L. Carey

Paper Mill Architect and Engineer

208 N. Laramie Ave.,

Chicago

Cable Address: ABCAR, Chicago

Codes ABC 5th Western Union

D. Manson Sutherland, Jr.

Consulting Chemical Engineer

Special Fibre Products and Processes
Homogeneous Boards
Waterproofing Compositions
Broad Street Bank Building
TRENTON, N. J.

Purification of Effluents
Forming and Drying Machines
Utilization of Waste Fibres
New York Office:
341 Madison Ave.

PORTLAND, OREGON

Is the ideal location for that new Pulp and Paper Mill of yours.

Portland is in the heart of the big timber region of the Pacific Northwest. Has an abundance of good water together with a plentiful supply of cheap hydroelectric power for manufacturing purposes. Good ocean and railway shipping facilities, a mild climate, and a fair supply of skilled labor, practically all of which is non-union.

I would be pleased to serve you in the location, design and construction of that new mill of yours.

HENRY BLACK

Complete Building Construction

383 Pittock Block - - - Portland, Oregon

Telephone Broadway 8060

Iron Workers, Cement Workers, Bricklayers, Carpenters, Roofers, Plumbers, Electricians, Cabinet-makers, Painters and Paperhangers; also Real Estate Bonds and Mortgages

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Industrial Reports
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Spalding Building
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Member Am. Soc. C. E.—Member Am. Soc. M. E.
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PULP, PAPER AND FIBRE MILLS
HYDRO-ELECTRIC AND STEAM POWER PLANTS
PLANS—SPECIFICATIONS—EVALUATIONS—REPORTS—CONSULTATIONS

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Pulp and Paper Mills, Power Plants, Chemical Plants

Engineering Design
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Chemists : Engineers : Managers

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FERGUSON ENGINEERS

JOHN F. FERGUSON

Complete Pulp & Paper Mills, Investigation of New Enterprises, Special Heat & Power Applications, Hydro-Electric Developments, Steam-Electric Power Systems, Sectionalized Paper Machine Drives.

Analysis, Design, Construction, Operation Efficiency

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Where Will Our Paper Come From?

B. T. McBAIN

Pulp and Paper Plant Problems Specialist

417 OREGONIAN BLDG. PORTLAND, ORE.

V. D. SIMONS

Industrial Engineer

PULP AND PAPER MILLS, HYDRO-ELECTRIC AND STEAM POWER PLANTS

ELECTRIFICATION PAPER MILL PROPERTIES

435 NORTH MICHIGAN AVE.
TRIBUNE TOWER
CHICAGO

PACIFIC COAST NEWS

American Chemical Society Meeting

A feature of the Pacific Northwest Regional meeting of the American Chemical Society to be held at Reed College, Portland, Oregon, April 6 and 7, will be a symposium on the wood pulp and paper industry. Experts in the field have been obtained to give addresses on topics pertaining to this subject as well as other subjects of interest to chemists, biologists and manufacturers.

Part of the Saturday forenoon session of the two-day conference will be devoted to the discussion of the pulp and paper industry with W. H. Gibbons, United States Forest Service, Portland, Ore., acting as chairman. B. T. McBain, consulting pulp and paper specialist, also of Portland, will address the group on "The Future of the Pulp and Paper Industry of the Pacific Northwest." "Co-operation of the Colleges and Industries," with special reference to the pulp and paper industry, will be discussed by Dr. H. K. Benson, head of the department of Chemical Engineering, University of Washington, Seattle.

During the afternoon, trips of inspection will be made to a number of chemical manufacturing plants, including the St. Helens Pulp and Paper Co. at St. Helens, Ore. Dr. Robert Eccles Swain, head of the department of chemistry at Leland Stanford, Jr., University, Palo Alto, Cal., will be the guest of honor and principal speaker at the conference.

Arrangements for the meeting are in the hands of a committee headed by R. K. Strong, professor of chemistry at Reed College. Reed College and the Oregon section of the American Chemical Society are joint hosts. The committee has arranged with the Congress Hotel for the visiting chemists to make their headquarters there.

Hawley Pulp & Paper to Expand

W. P. Hawley, president and founder of the Hawley Pulp and Paper Co., Oregon City, Ore., announced on March 3 that a $2,000,000 improvement program will be carried out by the company in the next two years. Practically all old equipment will be replaced under this plan, which includes the discontinuing of Mill A and substituting electricity for water as a direct source of power in the grinding of all pulp. A central steam plant will be constructed and all boilers will be replaced with high pressure type boilers that will effect a substantial savings in fuel and operation expenses.

Another unit of the plan is the rebuilding of the sulphite mill to make it strictly modern in all respects. All machinery will be electrically driven and all of the buildings concrete.

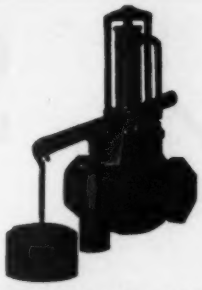
Willapa P. & P. Mill Award Contract

The Willapa Pulp and Paper mills awarded a contract late in February for the construction of a 60-ton pulp mill on property located between Raymond and South Bend, Washington. The contract calls for completion of the work by August 1 and the cost for the pulp mill plant, which also includes cut-up mill, kilns and machinery will be about $1,000,000.

Approximately 300,000,000 feet of pulp timber adjacent to the proposed mill is owned by the company, and this timber has cruised 93 per cent spruce, hemlock, and white fir. The entire output of the mill for the next ten years has been contracted for by Bulkley-Benton Co. of New York. Provision has been made so that it will be possible to increase the capacity of the mill to 500 tons of pulp daily output. The mill will be accessible to large freighters, inasmuch as it will be located within twelve miles of the ocean.

R. A. Swain is president of the Willapa Pulp & Paper Mills which is an Oregon corporation with headquarters in Portland.

Contract for the construction of the Gray's Harbor Water pipe line for the Gray's Harbor Pulp Co., will be let shortly at Hoquaim, Wash. This is one of the big undertakings in the building of this mill.



YOU can't shut down a hotel for repairs to the mechanical equipment—
Hotel service MUST be continuous, which is one reason why Mr. John Heidelberg, chief engineer of the new Morrison in Chicago, selected Davis Pressure Regulators for the recently erected new hotel and tower.

Another reason is that twenty Davis Pressure Regulators have been in service in the Morrison for fourteen years, and have been accurate, dependable, and economical. So it was only natural to install more, bringing the total to forty.

Mr. Heidelberg says he considers Davis Pressure Regulators far superior to other equipment for pressure regulation.

Send for the Davis catalogue, if you haven't one already. It explains the distinctive features of Davis design.

The G. M. Davis Regulator Co.
414 Milwaukee Ave., Chicago, Ill.

DAVIS VALVE SPECIALTIES
STEAM SAVERS SINCE 1875

P13-Gray

For power plant or process work

Fig. 106
Screwed Jenkins Standard Bronze Globe Valve

The paper and pulp mill industry is one of America's largest valve users. Steam and water consumed in vast quantities, must be controlled, and in this task Jenkins play a big part. For power plant or process work, there are types of Jenkins Valves which have proved their worth in wide-spread paper and pulp mill usage. Engineers in paper mills have learned through experience that the Jenkins Diamond stands for long term low cost valve service. Jenkins Valves in bronze and iron,—in standard, medium and extra heavy patterns—at supply houses everywhere.

JENKINS BROS.

80 White St. ....New York, N. Y.
524 Atlantic Ave. ....Boston, Mass.
133 No. Seventh St..Philadelphia, Pa.
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JENKINS BROS., Limited
Montreal, Canada London, England

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

SCHOPPER

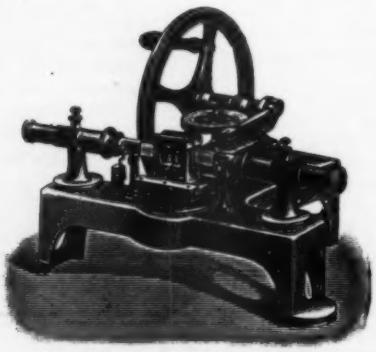
World Standard Paper Testers

All Kinds of Scales

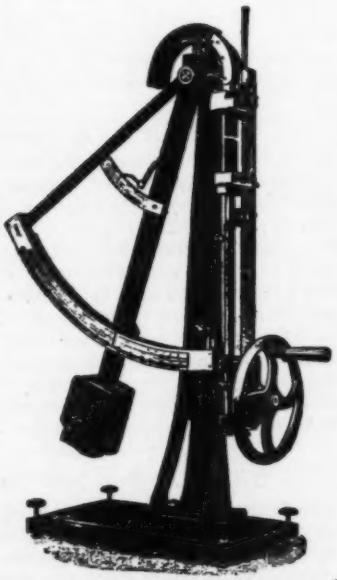
Patented

Schopper-Riegler Beating Tester
Uniformity of beating means better paper.

The Schopper Standard Desk Micrometer
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.

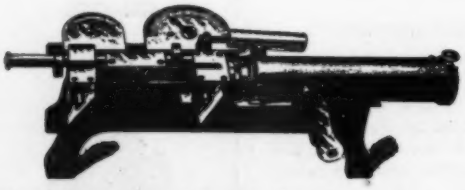


Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.



Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



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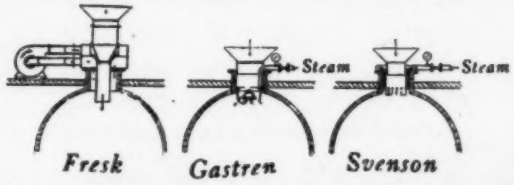
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Economy of the Sulphite Process

A THOROUGH analysis is made into the economy of the sulphite process as governed by conditions existing at the present time in the German paper industry. This analysis goes into the various operating details of the process and the means that have been rendered available for reducing the cost of the digestion in one way or another. The



charging of the wood into the digester without mechanical aid is shown to be fraught with many disadvantages, not the least being a reduced yield per unit of cubic contents of the digester. The use of air and steam for charging purposes, resulting in the introduction of the wood chips under considerable pressure into the digester, has enabled the production of the digester to be increased up to one hundred kilograms per cubic meter contents. The accompanying illustration shows a number of arrangements of this sort.

The Fresk apparatus works with air while the Castren and Svenson work with steam. The density or tightness with which the chips are filled into the apparatus also receives consideration and the relation between this characteristic and the operation of the digester are well explained. The consumption of steam is discussed as well as that of the sulphur.

The effect of accelerating the digestion process in order to obtain greater production is counteracted by the impairment in the quality of the product. Attention is called to the lack of definite information on the reactions that take place during the digestion of wood by the sulphite process. The diffusion of the digestion liquor, before actual reaction takes place, through the wood is a physical chemical process. The rapidity of the diffusion depends on the concentration of the liquor, but when the temperature is raised ten degrees, the speed of diffusion is increased only by one quarter. It is necessary that the diffusion of the sulphite liquor through the wood is as complete as possible in order to obtain proper disintegration of the wood. The temperature of the liquor must, accordingly, be rapidly raised to such a point where diffusion is strongly accelerated and where the speed of hydrolysis is as slow as possible. This will give as uniform disintegration of the wood as possible.

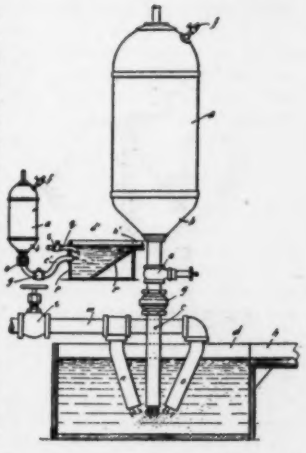
The digestion process may be considered as hydrolysis of the hemicellulose and partly as hydrolysis and saponification of the lignin. It is not definite at which point the sulphurizing of the lignin begins. It is most probable that the sulphurizing operation is a multi-molecular reaction which takes place at a slower speed than the hydrolysis which is a monomolecular reaction. If we do not allow sufficient time for diffusion to take place properly, then the concentration of the sulphur dioxide in the wood, and perhaps the temperature in the wood as well are not uniform, and, hence, the digestion of the wood will also be irregular. The outermost fibrous layers of the wood are accordingly more rapidly disintegrated and the center of the woody mass remains constituted of a core of undecomposed fibers. This portion of the wood has been softened in this manner, it is subjected to the partial decomposition of the fibers.

The free hydrogen ions are determinative as far as the speed of the digestion is concerned. The free ions naturally bear a certain relation to the concentration. The dissociation of the acid is affected by the concentration of the lime in the liquor. Catalytic influences of cellulose hydrolysis are not known. It is known that the decomposition of sulphur dioxide to sulphur trioxide can be very markedly accelerated by selendium sulphide and tellurium sulphide. Pulps are accordingly obtained which are brittle and brownish in color. These pulps have apparently suffered decomposition into sugar derivatives due to the too high concentration of free hydrogen ions. Other metals, such as calcium, iron, zinc, etc., have a similar action on the pulp.

The author spends considerable time in the original article in discussing the mechanism of the decomposition of the cellulose materials into forms of sugar and the like. A. Frohberg, Der Papier Fabrikant, 1928, pages 17-22.

Digesting Cellulose Fibers

THE process, which is carried out in apparatus shown in the accompanying illustration, consists in digesting the cellulose materials in a closed container (a). The contents of this chamber are then released through the pipe at the bottom of the container, controlled by the valve (e). The contents of the digestion chamber are accordingly shot through into a vessel (d) which is filled with a suitable liquid, whose temperature is quite lower than that of the digested materials. The mouth of the conduit that leads from the digestion chamber dips below the surface of liquid in the vessel (d) for quite an appreciable distance. This tends to induce a reaction in the mass of material emitted by the conduit with the result that the cellulosic substances are disrupted and the cellulose fibers are separated. W. I. Chidester, Portland, Ore. United States Patent No. 1,659,809.



Correct Choice of Steam Pressure for Drying Paper

THIS question is examined from many angles and particularly in connection with the efforts being made within recent times to obtain economy in the steam utilization field. This problem is discussed in great detail and valuable numerical data is given. The following conclusions were finally drawn from this investigation: The conditions that affect the choice of pressure of steam must be studied separately in each individual pulp and paper mill. The interest on the investment and the profits being made by the enterprise must also be taken into consideration. It appears that in most cases a pressure of one and one-half to two

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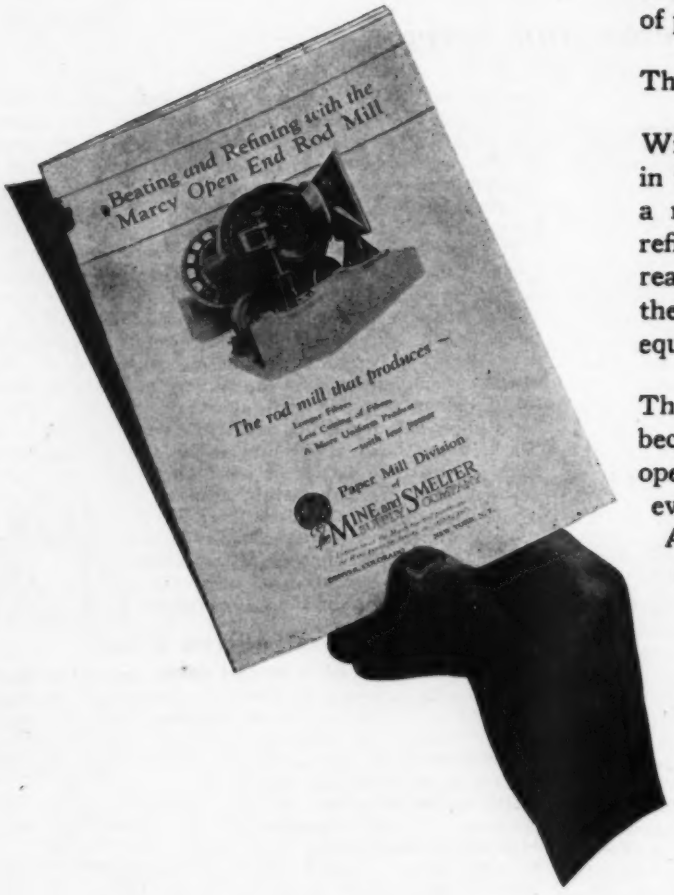

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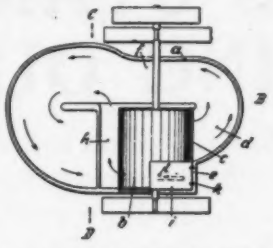
atmospheres in the steam entering the cylinders is most advantageous, irrespective of the fact that the machine is more expensive. In combination plants it is unconditionally more advantageous to use steam at a lower pressure, for the steam before entering the drying cylinders can perform useful work in other parts of the mill. B. Sasonow, Bumaschnaja Promischlenmost, 1927, pages 253ff.

Beater

THE trough of the beater has a head race and a tail race. It is also provided with the usual rotating beater roll. The beater roll is wider than the tail race and is seen at (b) in the accompanying figure, the tail race being indicated at (f). The beater roll is arranged so as to stand out beyond the outer wall of the tail race. Means are provided for conducting the material that is being beaten over the top of the outstanding part of the beater roll and in a direction which is parallel to the axis of the cylinder to the head race, shown at (h). H. Mallickh. United States Patent No. 1,657,218.

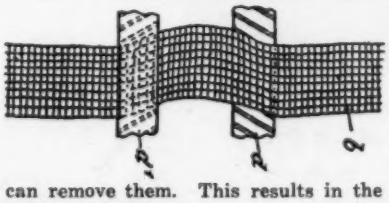


Waterproofed Paper

A WATERPROOFED flexible sheet of paper is produced by passing a thin sheet of close-grained fibrous cellulosic material through or in contact with a bath of bituminous proofing material of relatively high melting point and heated to a temperature substantially above 250 degrees F. The sheet is removed before it is saturated with the waterproofing material. A preferable proofing material consists of a mixture of a bituminous product known as mineral rubber 100 parts, scale wax 10 parts and Montan wax 2 parts. The web of paper remains in the waterproofing bath for only five seconds. J. Reid, assignor, Scutan Co. British Patent No. 281,316.

Cleansing Wet Felts

THE new process for cleansing wet felts in the papermaking machine consists in passing the felt in its original width through a device which distorts its structure both in front of and after the spraying point. The width of the felt is thus increased alternately on one side and on the other. The pores of the fabric are thus opened up, and the particles of dirt that have lodged therein are loosened so that



the water can remove them. This results in the felt being very thoroughly washed.

Thus the felt is passed over the grooved devices shown in the accompanying illustration at (d) and (d'). The surfaces of these devices are provided with porcelain plates which are grooved. These devices may be moved horizontally in order to regulate the intensity of their action on the felt. It is also seen that the grooves on these two devices run in opposite directions, that is on one the grooves run from right to left and the other from left to right. Hence the felt is pulled towards the right by the first device and to the left by the second. This opens and distorts the pores of the fabric and while this action is taking place, the stream of water from a spray nozzle washes out the dirt. E. von Asten, German Patent No. 453,867.

Hydration of Cellulose in Papermaking

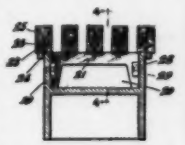
FROM a study of the behavior of highly compressed blocks of vulcanized raw paper, as representing in many ways the behavior of individual fibers, evidence is obtained in support of the theory that the hydration of cellulose during beating is a purely physical phenomenon, cellulose exhibiting all the properties of an elastic gel, while differing from other elastic gels in that it is porous and contains considerable quantities of absorbed gases. Results are given showing the effect of pressure, vacuum, specific external surface, temperature and dissolved substances on the velocity of imbibition of water by cellulose.

Pressure has a greater accelerating action than vacuum, but the rate of increase of imbibition falls very considerably for pressures above 75 pounds per square inch. Increase in temperature causes dehydration, but in a negligible degree below 40 degrees F. Increase in specific external surface increases the velocity of imbibition proportionately, even when the increased surface is due in part to swelling of the fibers, as is the case after prolonged immersion. It is this increase in specific external surfaces, chiefly by fibrillation, that is responsible in a large degree for the hydration effect of beating.

Alum, though showing initially an accelerating action, later retards imbibition. Caustic soda accelerates or retards imbibition depending on the concentration. Sulphuric acid is a more satisfactory accelerator, particularly at a concentration of 0.00125 mole. The Schopper-Riegler tester is unsatisfactory as an indicator of the degree of hydration of pulp, a more reliable method being to determine the quantity of water retained by the pulp under a definite standard pressure. J. Strachan, Proceedings of the Technical Section of the Papermakers' Association, volume 6, pages 139-167.

Suction Box for Papermaking Machine

THE suction box in the Fourdrinier papermaking machine is provided with a cover which comprises a wooden block, as shown at (25) in the accompanying figure. The longitudinal grain of the wood extends in a direction which cuts through the path of the wire at right angles. The wood is also so arranged that the annual growth rings in the face of the block extend crosswise of the wire. F. J. Latham, Rumford, Me., assignor, The Oxford Paper Co. United States Patent No. 1,657,509.



Pulp by Digestion with Silicic Acid Containing Alkali

THE manufacture of pulp from wood, straw and the like by digestion under pressure with caustic alkali or with silicate is a well-known process. It is also known that wood or other organic matter will entirely dissolve in caustic alkali or in silicates and that the liquor obtained in the pulp digestion process is treated with caustic alkali under high pressure at high temperature as well as directly evaporated and that similar liquors are distilled dry with alkali.

In the regeneration of the used alkali in this process, it is principally obtained in the form of sodium carbonate, which must be causticized with milk of lime in order to render it usable for digestion purposes.

The new invention is intended to avoid this causticization by adding beforehand to the liquor so high a content of silicic acid that is sufficiently alkaline (caustic) after regeneration through evaporation and burning or dry distillation, in order to be able to use it again without the necessity of causticizing with lime.

The suitable composition of the liquor is obtained by the addition of silicious materials, such as sand, clay, gangue, in addition to alkali-containing materials, such as soda, sulphate, silicates, for example, felspar. If the alkali or the silicious materials contain alumina, then this is completely precipitated as silicate on solution of the substance, and then when the precipitate is filtered off, the liquor can be evaporated in ordinary apparatus without there being any danger of the formation of scale. The precipitate can be used over again in the smelting process.

A certain disadvantage may arise due to the melting point of the substances being too high in the furnaces. This may be counteracted by the use of a mixture of potassium and sodium silicates or by the presence of neutral salts. The temperature may on the other hand be increased in the furnaces by the use of preheated air intead of coal air and also the fuel can be preheated by means of the waste heat from the furnace. H. Wollin, German Patent No. 52,956.

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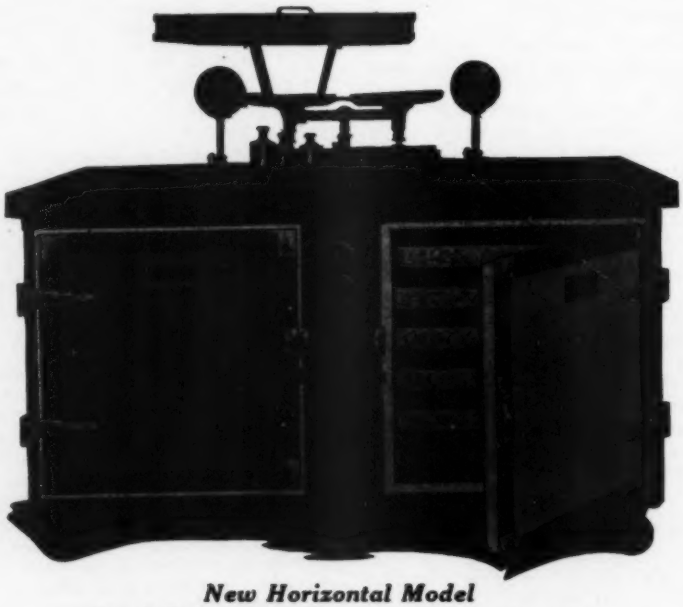

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New Methods for Operating Control in Half Stuff and Paper Mills

THE importance of operating control is discussed from the standpoint of the growth of the pulp and paper industry, and the technical and economic phases of the operations in pulp and papermaking. The continuous control of the freeness of the stock is emphasized. In Figure 1 the curve (D_1) represents the steam consumption corresponding to the heat consumed in the papermaking machine and (D_2) the steam consumption for the necessary heating of the air in the room in the air relationship with the dry pulp content of the paper web, as it enters the dry end of the machine. The figures hold good for a pressure of 0.5 atmosphere in the steam and an external air temperature of 10 degrees C.

The continuous control of the freeness of the stock requires the use of an instrument which is both automatic and recording just like the automatic recording flue gas analyzing instruments. The freeness of the stock is important not only as far as the drying action of the drying cylinders in the dry

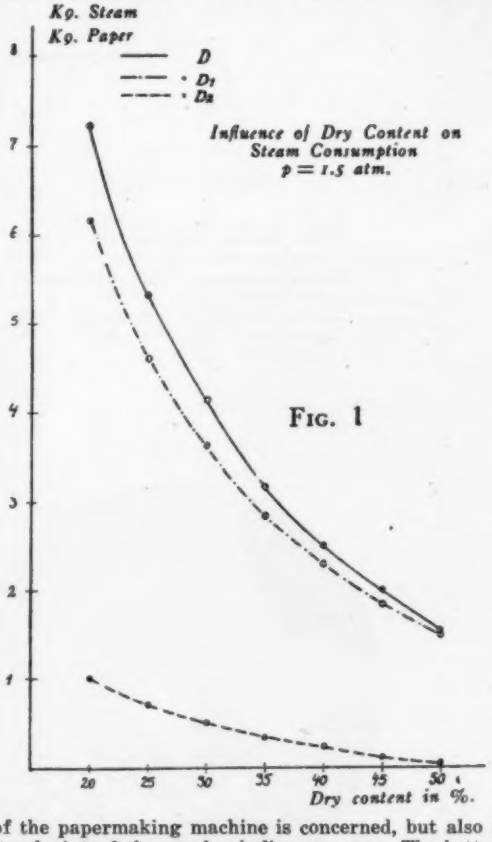


FIG. 1

end of the papermaking machine is concerned, but also from the standpoint of the wood grinding process. The better the quality of the ground wood, the better the paper runs on the machine. It is, however, false to assume that the quality of the ground wood depends solely on its freeness. The strength of the ground wood will determine the speed with which the paper machine can run, but there is no definite general law existing between the strength of the ground wood and its freeness. It is rather a specific relation for each make of ground wood.

A new measuring principle has been devised on which instruments for determining and controlling the density of the stock are based. This instrument is shown in Figure 2. The apparatus consists of a source of light (J_1) whose rays are made parallel to the axis of a condensing lense and then pass through a glass tube whose frontal surfaces are parallel planes. The portion of the light, which is not absorbed, illuminates the prism of a contrasting photometer (W), whose secondary image field is illuminated always with the same intensity of light from a comparative light source (J_2) which is adjusted at a constant distance from the field. A new adjustment of the photometer in which the uniformity of the light in the prism is effected not by the change in distance of one of the sources of light, but in a much more sensitive manner by electrical regulation of the source of light (J_1). A finely-calibrated rheostat (R) is used for this purpose, which has a number of scales corresponding to the different lengths of the absorption container (B), these scales being dimensioned in percentage dry content. The graduations of brightness of the two sources of light are so chosen that the work is always carried out in the field of illumination above the red rays.

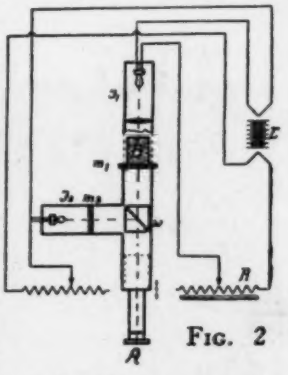


FIG. 2

There was only a short step to make between this apparatus and the automatic regulating and recording instrument, which allows suspensions of fibrous material in water of all practical concentrations to be controlled. It depends on the principle that the suspension which must be tested is maintained at constant volume per unit of time. This is accomplished with the aid of a bulb, which is subjected to constant illumination on the front side. The light-sensitive cell is located behind the bulb.

Figure 3 shows the arrangement of a selenium cell, which is inserted into a circuit with constant amperage. The registering instrument is also located in this circuit as well as a resistance for regulating a multiple tubular intensifier which actuates the valve controlling the admission of diluting water, in case the device is used as a regulator of the density of the stock. The use of the selenium cell possesses, however, the disadvantage of great lag, for it takes quite a few minutes before it can respond to a change in resistance which corresponds to a change in the intensity of the light. A photoelectric cell is, therefore, used preferably in place of the selenium cell. It is more sensitive than the selenium cell and acts immediately. The use of the photoelectric cell also avoids the selective sensitiveness of the selenium cell

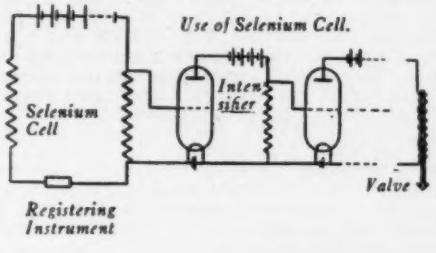
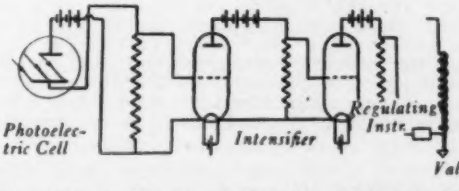


FIG. 3



which is most sensitive to changes in resistance which take place corresponding to alteration in the intensity of light around the zero point. The photoelectric cell works on the principle of the release of electrons whose number depends on the intensity of the illumination. The result is that a proportional change in the current corresponds to a certain change in the density of the suspension of paper stock in water through the intermediate action of a change in the intensity of illumination. Dr. Walter Brecht, Der Papierfabrikant, 1927, pages 809 to 816.

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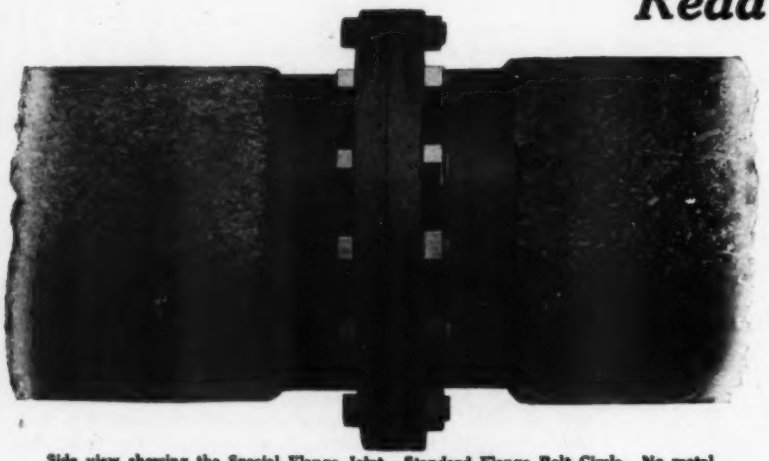

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Yours very truly,
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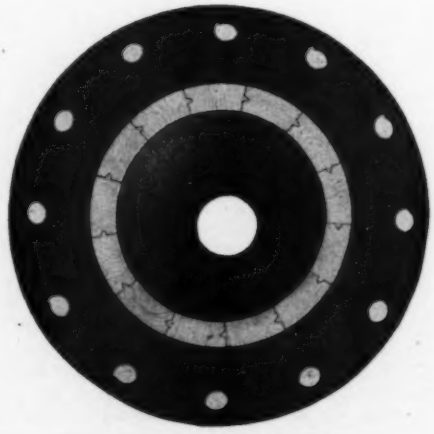

End view of Special Flange Coupling. Note that the metal is outside.

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Washing Bleached Pulp

THE little that has been published on the washing of bleached pulp indicates that the consumption of wash water is very high. Dickmann calculates this to be 225 cubic meters per ton of air dry pulp. An interesting experiment was carried in the Paper Laboratory of the Leningrad Technological Institute of the Wolodarskaja mill in order to obtain a correct idea of this water consumption. Nine hundred kilograms of air dry pulp were placed in a bleaching beater of approximately 15.5 cubic meters capacity, and this amount of pulp was bleached with the aid of 9.5 per cent of chloride of lime at a temperature of approximately 35 degrees C. for a period of approximately seven hours. Thereafter the pulp was washed with ninety cubic meters of water for a period of three hours.

Samples of the wash water were taken at stated intervals and the dry residue and the potassium permanganate solution consumed were determined. The results of this determination showed in spite of the fact that the volume of water used was about one hundred times the mass of pulp washed, nevertheless the water running out of the beater was not always clean. In contradistinction with pure water, the waste water contains five times as much dry residues.

It is only within the first hours of the treatment that the washing action of the water is intensive, and after this period of time has elapsed it is found that the pulp does not yield its soluble ingredients except with great difficulty. The continuous washing of the pulp in washing drums appears to be irrational. Periodic washing is more advantageous.

Comparative washing tests were accordingly carried out in the laboratory in which ten gram samples of pulp were treated with two hundred cubic centimeters of a five per cent sulphuric acid solution. Then the mixture was placed on a disc of filter paper and thereafter washed in one series of tests in a continuous manner and intermittently in another series of experiments. The acidity of the filtrate was determined after each hundred cubic centimeters of wash water used. In this manner, the progress of the washing operation can be followed through from beginning to end and the results obtained easily show that the continuous washing of the pulp is less effective than the intermittent washing. It is better to wash the pulp with large quantities of water several times than with the same quantity of water in a continuous flow. S. Flotijew, Bumaschnaja Promischlennost, 1827, pages 246ff.

De-Inking Paper

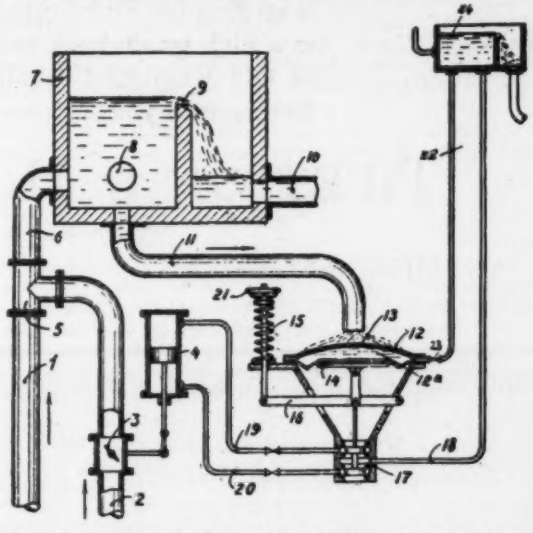
THE "apparent" degree of de-inking of newspaper was determined as follows (30 to 40 minutes, 50 grams in one liter with paddle at 1300 r.p.m); sodium oleate (five grams), 100; fuller's earth (ten grams) in 0.012 normal sodium hydroxide, 95; 0.1 normal sodium silicate, 84; sodium resinate (five grams), 83; 0.1 normal sodium hydroxide, 82; 0.02 normal sodium hydroxide, 78; 0.1 normal borax, 75; gelatin in 0.02 normal sodium hydroxide, 71; sodium hydroxide (70 to 55 degrees C), 70; 0.1 normal sodium carbonate, 69; gum arabic (ten grams), 65; gelatin (ten grams), 55; 0.1 normal sucrose, 46; distilled water, 30; egg-albumen (ten grams), 26; 0.1 normal sodium, calcium, or aluminum chloride, or lime water, zero. The ideal de-inking agent is a substance, preferably colloidal, which is absorbed much more strongly by ink than by paper. If the reverse is the case, a mordanting action results. T. R. Briggs and F. H. Rhodes, Fourth Colloid Symposium, 1926, pages 311 to 327.

Maintaining Definite Degree of Dilution in Half Stuff and Pulp

AS is well-known, the thickness of the sheet or web frequently varies in the paper machine, the board or cardboard machine, and this means that the dry content of the stock that is allowed to flow into the machine likewise varies. In order to attain uniformity in the density of the mixture that flows into the stuff chest of the machine, the dilution of the stock is accomplished in the present invention, which is seen in the accompanying illustration, by the kinetic force of the mass, and consequently by the impact of the stock against a suitable device. This arrangement permits correct and automatic regulation of the dilution of the paper stock.

The mass, whose degree of dilution must be regulated, is led through the pipe (1) and is mixed with water or diluting fluid which enters through the pipe (2). The mixture then flows along further in the pipe (6) to the box (7) and the greatest portion of the mixture then immediately flows over into the pipe (8). A smaller portion of the mixture of pulp and water flows over the over-flow edge (9) and is carried back again through the pipe (10) to either the pipe (1) or (8). Another portion flows through the pipe (11) to the plate (12) and from that point through apparatus, which is not shown in the illustration, to the pipe (8) or (1).

The container (12a) which is filled with the fluid, is connected with the flowing mass of pulp and water by means of the perforation (13) and the changes in the speed will consequently effect a change in pressure in the interior of the container (12a). These changes then immediately affect the membrane (14) so that the lever (16) is moved upwards or downwards, according to whether the speed increases of decreases. When the arm (16) swings upwards, the pressure fluid from the pipe (18) is conducted through the pipe (19) to the upper side of the auxiliary motor (4) and the valve (3) opens. When the arm (16) swings downwards, the pressure fluid is conducted through the tube (20) to the under-side of the auxiliary motor (4) and the valve (3) is shut.



When the pressure liquid is fed to one of the pipes (19), (20), then the excess liquid can run through the other of these pipes. The set screw (21), which is regulated by the tension of the spring (15), serves for maintaining the desired degree of dilution in the stock.

The container (12a), which is filled with liquid and which is formed from the plate (12) and the membrane (14), does not require any liquid fed in the strict sense of the word, for the reason that it can absorb liquid from the flowing mass through the perforations (13) as the pressure increases, and can give back this liquid to the flowing mass of pulp and water as the pressure decreases. However, in order to prevent the perforations from becoming clogged up with the solid ingredient of the miixture of pulp and water, it is advantageous to maintain the liquid which is under the plate (12) always at a certain pressure, which is greater than that which is exerted by the mass of flowing pulp and water. This can be obtained in the following manner by feeding liquid to the container (12a) for example through the pipe (22), which leads from the container (24). K. Holter and O. Oviller, German Patent No. 453,445.

Cooking Sulphite Pulp

THE wood chips are fed into the digester. A quantity of heated liquor is fed simultaneously with a quantity of wood chips into the digester so as to soak and wash the chips into position. G. H. Tomlinson, Montreal, Canada. United States Patent No. 1,657,048.

By the same token that some people think you can make a waiter out of a taxi cab driver by dressing him in a tuxedo, they imagine that calling a Machine Finish "E.F." makes it an English Finish.

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FROM all accounts, there is activity of fair compass in the paper industry. Reports indicate that business is developing somewhat spottily, that consumers are proceeding carefully in absorbing supplies, and are relying on deliveries from mills to cover their requirements as they arise, and that certain classes of paper are enjoying relatively much better demand than are others, but viewing the market situation as a whole it can be stated that the movement of paper aggregately is of fairly large volume and that the business transpiring at present measures up well with that recorded at this season in former years.

The outlook, nearly everyone agrees, is encouraging, if not bright. It was marked that nearly all the speakers at the annual convention of paper manufacturers in this city last week expressed themselves quite optimistically concerning the future of the paper market; most of them said they looked for steady demand and big consumption during this year, and several made predictions that more paper will be consumed in the United States in 1928 than ever before in any single year. These opinions came not alone from those connected with the industry but from bankers, economists and others not in any way allied with the paper trade, who based their views on the general business situation and who, anticipating good business generally, feel that the paper industry will share in the activity.

Reports with few exceptions tell of paper mills operating on a moderately broad scale. Production at present is, no doubt, at a high point; certainly there has been an increase in recent weeks, brought about by a generally improved demand for paper of many kinds. Jobbers say they are encountering better buying interest. that printers, publishers, converters and other consuming customers are ordering in somewhat larger volume and are placing orders in a more frequent manner, and this, of course, is reflected in the demand which paper manufacturers are experiencing because jobbers and distributors in turn are looking to mills for increased supplies. The market situation exhibits all the earmarks of a healthy condition. The buying that is being done is almost solely against definite needs. No one appears to be stocking up paper of any kind, because there is no reason for them doing so; paper manufacturers are keeping the market fully supplied and are in a position to produce a good deal more paper if need be, and consumers, apparently appreciating this, are buying as they go. This, it would seem, should insure a more or less steady demand for some time to come as buyers in all likelihood will be in evidence right along.

The newsprint industry got off to a good start in January, when production showed a fair rate of increase over the preceding month. According to the monthly report of the News Print Service Bureau, Canadian mills produced a total of 186,721 tons of newsprint in January and shipped out 186,829 tons, while United States mills produced 119,525 tons and shipped 114,211 tons, making a combined total for the two countries of 306,246 tons produced and 301,040 tons shipped, compared with a production of 300,912 tons and 305,322 tons shipped in December last. During January, 17,939 tons of newsprint was made in Newfoundland and 1,168 tons in Mexico, so that the total North American output for the month amounted to 325,353 tons, contrasted with 315,737 tons in January, 1927.

The Canadian mills produced 24,997 tons more newsprint in January than in the same month of 1927, which was an increase of 15 per cent. The United States output was 15,870 tons or 12 per cent less than in January, 1927; in Newfoundland 433 tons or 2 per cent more, and in Mexico 56 tons more, making a total increase of 9,616 tons or 3 per cent over January last year. During January the newsprint mills in Canada operated at 88 per cent of rated capacity and the United States mills at 80.7 per cent. Stocks of newsprint at Canadian mills totaled 37,731 tons at the end of January and at U. S. mills 25,905 tons, making a combined total of 63,636 tons which was equivalent to 4.5 days' average production.

The paper board branch of the industry scored a decided comeback in January following the slower period during the holiday season in December. Board production in the United States gained considerably in January as compared with the preceding month, amounting to 203,031 net tons of all grades of board, contrasted with 186,920 tons in December, according to the monthly statistical summary compiled and issued by the U. S. Department of Commerce. Board mills produced at 84.5 per cent of their rated capacity in January, against 74.8 per cent in December, and received new orders calling for a total of 202,627 tons of board, contrasted with 178,224 tons in December, and had unfilled orders for 82,356 tons at the end of January, against 74,430 tons a month earlier. Shipments of board from mills in January aggregated 195,714 tons, compared with 181,400 tons in the preceding month, and stocks of board at mills at the close of January amounted to 49,502 tons, against 42,610 tons at the end of December. Board mills consumed a total of 188,580 tons of waste paper in January, compared with 177,329 tons in December, and had stocks on hand amounting to 157,176 tons at the end of January, against 145,549 tons a month previously.

The paper production index number for December was 104, compared with 102 for November last and 119 for December, 1926, taking 1919 at 100 per cent, according to the U. S. Department of Commerce. The monthly average for 1926 was 122 and for last year it was 108.

Newsprint is moving into consuming channels in a steady manner, and signs would show that consumption is on a fairly high level. At any rate, publishers in New York City are using big tonnages of print paper to put out large editions of daily newspapers, and circulation of dailies in this city is reported mounting. There has been an expansion of demand for wrapping paper. Retail merchants and other consumers evidently are absorbing supplies to be in readiness for the spring movement of merchandise, and reports say that most kraft mills are well sold up and in some instances are falling a bit behind in deliveries. Moreover, prices of wrapping are firm.

Fine papers are enjoying more market activity, demand having improved to a considerable degree, and it is stated that bond and ledger manufacturers are busier than they have been in some months. Prices rule steady to firm, and members of the trade insist that any changes that are likely to occur will be in an upward direction. Tissue papers are in fair demand, and there is a consistent movement into consuming channels of book paper. Felts and building papers are experiencing seasonal quietness, and the same is true concerning wall board. Box boards are showing more market activity day by day, and mills gradually are increasing production to take care of the broadening demand.

Bemis Associates Inc. Hold Annual Meeting

At the annual meeting of the stockholders of Bemis Associates, Inc., held February 11, Robert M. Bowen was re-elected as president and general manager, and Wm. T. Jarvis as vice-president and secretary.

The board of directors is as follows: Robert M. Bowen, William T. Jarvis, Robert F. Wight, Alan F. Howard and Frank Ball. Mr. Ball is a new director, and is superintendent of the Manhattan Rubber Mfg. Co. of Passaic, N. J.

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Papermaking Rags

Activity in papermaking rags is on a limited scale, and, if anything, the market has quieted during the last several weeks. Demand from consuming quarters is at best of small volume, and it is apparent that paper manufacturers are confining their buying almost solely to supplies actually and directly required, evidently appreciating that the market situation—from a majority of angles—is altogether in favor of buyers, and that consequently there is a lack of incentive to stock up with rags. Prices as quoted in the market have undergone little change of importance. Such revisions as have occurred have been in most instances in a downward direction, but the recessions recorded have been slight, market levels holding somewhat stationary. Dealers contend that values are as low as prevailing supply conditions warrant, and assert that any further decline in prices will lead to a shrinkage of supplies because collectors will further curtail operations. However, with probably a few individual exceptions, there is no scarcity of any grade of papermaking rags, and buyers as a general rule are securing the supplies needed at about their own prices so long as they offer figures within reasonable bounds.

A feature in rags is the steady decline in imports, more especially of the higher qualities of papermaking rags. Importers report that the markets in Europe are in numerous cases above a parity with market values here, with the result shippers abroad are not pressing sales to the United States, and further that American paper mills are filling the bulk of their requirements with domestic rags and offer prices for foreign stock which are frequently unworkable abroad. This situation may eventuate in a shortage of rags here, but there is at present no visible signs of such a condition developing. Statistics show that imports of papermaking rags into the United States last year recorded a sharp decreased compared with 1926, and a much greater decline contrasted with 1925, and it has been noted that importations during the last few months have decreased steadily.

Some grades of new cuttings are moving relatively well into consuming channels, and there has been a little stiffening of market prices of such rags. However, the full list of grades of cuttings shows but slight price change. No. 1 white shirt cuttings are quoted by dealers at 11.75 to 12 cents per pound f.o.b. shipping points, and unbleached muslins at 9.75 to 10 cents. These descriptions are in fair demand. Other grades wanted in moderate amounts include blue overall cuttings, which are quoted at 6.75 cents a pound at dealers' points; light silesias, at 7.50 cents; O. D. khaki cuttings, at 5.75 cents; black silesias, at 4.75 cents; fancy shirt cuttings, at 5.75 cents. and washables, at 4.50 cents.

Mill demand for roofing rags has slumped to a very decided degree, and prices of these grades are a little down. Felt paper manufacturers are reported experiencing seasonably slow business in their product, so much so that some mills have curtailed operations, and thus are not in need of as large quantities of rag stock. Dealers quote No. 1 domestic roofing or cloth strippings at 1.90 cents a pound f.o.b. shipping points, and No. 2 domestic at 1.50 cents; perhaps some buying is being accomplished by consumers at slightly under these price levels. Foreign dark colored cottons are selling at 1.60 cents a pound ex dock New York, though spot lots are fetching a premium over this price of $2 to $3 a ton, sales of spots having been reported at 1.75 cents a pound on the dock.

Old white cottons and thirds and blues are in routine movement, and no changes have developed in prices. Foreign rags of nearly all classes are in restricted demand, and certain grades are selling in such a slack way that market prices are nominal mainly, there being no definite value level established.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock	New York and Chicago
White shirt cuttings, No. 1	11.75-12.00
White shirt cuttings, No. 2	7.00- 8.00
Fancy shirt cuttings	5.50- 5.75
Washables, No. 1	4.50- 4.75
Unbleached muslin	9.75-10.00
White lawns	9.25- 9.50
Overall cuttings, blue	6.75- 7.00
Black silesias	4.50- 4.75
Light flannelettes	8.00- 8.25
Canton flannels, bleached	9.00- 9.25
Canton flannels, unbleached	8.25- 8.50
Shoe cuttings, bleached	8.25- 8.50
Shoe cuttings, unbleached	6.50- 6.75
Light silesias	7.25- 7.50
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	5.50- 5.25
Corduroy cuttings	3.25- 3.50
Cottonade cuttings	3.25- 3.50
Linens, No. 1, white, foreign	13.00-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	5.50- 6.50
Whites, No. 2, repacked	2.50- 3.00
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.75- 1.90
Thirds and blues, repacked	2.15- 2.35
Black stockings	3.75- 4.00
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	5.00- 5.25
Roofing, No. 1 (cloth strippings)	1.85- 1.95
Roofing No. 2	1.45- 1.55
Linsey, garments, foreign	1.75- 1.85
Dark colored cottons, foreign	1.60- 1.75
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

The market tone in old rope is soft, and prices of this papermaking raw material are gradually moving to lower levels. Further recession has been recorded in the last several weeks. Generally, paper manufacturers offer only 3 cents a pound or thereabouts at shipping points for domestic No. 1 old manila rope, while foreign old rope seldom elicits bids from consumers of more than 2.75 cents ex dock New York. There are some mills paying a little in excess of these figures when the need of supplies warrants or when extra quality old rope is desired, but the bulk of current business is transpiring at about the prices mentioned. Dealers state that prices abroad have steadied in a manner that it is difficult for them to buy foreign rope and dispose of it to paper mills here at a profit, and not much importing is being done at present. Old strings are in fair demand and are bringing steady prices, mixed strings being worth around a cent per pound f.o.b dealers' shipping points and sisal strings 1.75 to 2 cents a pound.

Paper manufacturers also are neglecting old bagging to a very noticeable degree. Occasional purchases are noted but the aggregate movement of supplies into consuming channels is small, and buyers have matters in their favor so far as prices are concerned. No. 1 scrap bagging is available at 1.65

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VERA CHEMICAL CO., OF CANADA, Ltd. ..... Freeman, Ont.
EMPIRE SIZE & CHEMICAL CO. ..... Albany, N. Y.
ADIRONDACK MINERAL CO. ..... Carthage, N. Y.
SUPERIOR SIZING CO., Inc. ..... Lockport, N. Y.
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cents a pound at shipping points, and roofing bagging at 1.25 cents. Gunny is seasonably quiet.

F.o.b shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.65-1.80
Gunny, No. 1 foreign	1.55-1.65
Scrap bagging, No. 1	1.60-1.70
Roofing bagging	1.20-1.30
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila rope, No. 1 foreign	2.75-3.00
Manila rope, No. 1 domestic	3.00-3.25
Sisal strings	1.75-2.00
Mixed strings	.90-1.15

Old Paper

The outstanding feature in the old paper market is the active demand for and strength in prices of old books and magazines. Mills consuming such stock have been in the market for large quantities recently, and still show a distinct desire for additional supplies. The market is well sold up, and prices of books have moved upward gradually, which has been rather in contrast to other descriptions of waste paper, nearly all of which have either declined or simply held their position in price.

In the East, sales of No. 1 heavy book stock have been made to mills at 1.45 cents a pound f.o.b. New York, and of No. 1 crumpled books at 1.25 cents. About these same prices rule in the Middle West, though slightly higher has been paid in some cases. Ledger stock is steady in price and demand, and is bringing 1.60 to 1.85 cents per pound at shipping points, depending on the quality of packing. Shavings of nearly all grades are in limited demand and prices have eased further to where No. 1 hard white shavings are reported available in the East at 2.75 cents a pound f.o.b. New York, and soft white shavings at as low as 2.35 cents at dealers' points. Old kraft has weakened a bit in value, and is quoted at 2 cents a pound at shipping points for No. 1 packing.

Folded news is moving fairly well at a price range of 65 to 75 cents per hundred pounds at dealers' points, and No. 1 mixed paper is quoted at 45 to 60 cents per hundred pounds.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.75-3.00
Hard white shavings, No. 2	2.50-2.75
Soft white shavings	2.35-2.65
Colored shavings	1.00-1.25
Heavy book, No. 1	1.40-1.50
Crumpled book, No. 1	1.20-1.30
Ledger stock	1.60-1.85
Kraft, No. 1	1.95-2.00
New kraft cuttings	2.65-2.80
Manilas, No. 1	.75- .85
White blank news	1.50-1.60
Overissue news, No. 1	.75- .85
Folded news	.65- .75
Sulphite mill wrappings	.70- .80
Old corrugated boxes	.60- .65
New corrugated box cuttings	.80- .90
Mixed paper, No. 1	.45- .60
Common paper	.35- .40

Pulpwood

There is fair buying of pulpwood along routine lines reported, but the market shows little change of consequence or feature of importance. Ruling prices are, as pointed out by members of the trade, on a wide range, depending on the location, tonnage of wood involved, quality and various other controlling factors.

Exports of pulpwood from Canada, all of which came to the United States, in January, 1928, amounted to 113,527 cords, valued at $1,057,959, compared with 125,565 cords of a value of $1,195,473 exported in the same month of 1927. Exports from Canada during 1927 reached a new record total, amounting to 1,541,769 cords of a value of $15,702,705, con-

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trasted with 1,391,738 cords of a value of $14,066,030 in 1926, and 1,423,502 cords in 1925.

Mechanical Pulp

Reports tell of rather limited market activity in mechanical wood pulp yet there are signs that more business is transpiring than is visible on the surface of the market. In other words, consumers in at least some cases are buying fairly freely but are proceeding cautiously in placing orders and seemingly are endeavoring to cover up their operations, not caring to excite the market while appreciating that the price tone is firm and that any show of tonnage purchasing might serve to send market values up against themselves.

Quotations are well maintained though no important change has taken place. Canadian producers are asking about $25 a ton f.o.b. pulp mills for prime spruce ground wood, and imported ground wood of Scandinavian origin is held at around $31 per short ton ex dock American Atlantic ports. Domestic ground wood is nominally about $26 or $27 a ton at grinding plants.

Production of ground wood in the United States in 1927 totaled 1,030,966 tons, according to statistics compiled by the American Paper and Pulp Association, compared with 1,168,845 tons in 1926, and 1,092,687 tons in 1925. Imports of ground wood into this country last year amounted to 219,285 long tons, valued at $5,961,821, contrasted with 271,213 tons of a value of $8,278,220 imported in 1926.

Chemical Pulp

With a somewhat tighter supply condition developing in foreign pulp owing to the continued shutdown of pulp mills in Sweden, buying interest in domestic chemical pulps appears to be quickening, and while consumers are proceeding carefully in entering purchasing commitments, it is apparent that market activity is on the increase. Domestic pulp manufacturers are looking forward to a much more satisfactory market for their product over the balance of this year, since they feel more domestic pulp will be needed and more bought because of a reduction in available supplies in Europe, more especially Scandinavia.

Market prices are ruling steady to firm, and it can be said the tendency is upward. Leading manufacturers continue to quote 3.75 to 4 cents a pound for No. 1 bleached sulphite f.o.b. pulp mills, and well above this price level is named on some qualities of sulphite, while No. 1 strong unbleached sulphite is quoted at 2.50 cents and higher at producing points and No. 1 book grade sulphite at 2.75 to 3 cents. Bleached soda pulp is selling at about 3.25 cents a pound f.o.b. pulp mills, and No. 1 kraft pulp at 2.75 to 3 cents per pound.

The United States production of chemical wood pulp in 1927 reached a total of 1,292,315 net tons, showing a slight increase over the 1,291,533 tons produced in 1926, according to statistics compiled by the American Paper and Pulp Association. Last year's output, in fact, set a new high record. Imports of chemical wood pulp into the United States also established a new record in 1927, totaling 1,280,285 long tons of a value of $80,124,449, comparing with 1,278,548 tons of a value of $83,208,851 in the preceding year.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	3.75-4.75
Easy bleaching sulphite	2.75-3.00
Unbleached sulphite, No. 1 strong (news grade)	2.45-2.70
Unbleached sulphite, No. 1 book	2.75-3.00
Soda pulp, bleached	3.00-3.25
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Most paper and pulp chemicals are moving in fair-sized quantities though principally against contracts, and prices as a rule are on the firm side. Bleaching powder is quoted at 2 to 2.35 cents per pound, in large drums, f.o.b. works. Casein prices are around 17.50 cents a pound for the domestic product, and 18 cents for imported casein, duty paid. Soda ash is on a contract quotable basis of 1.32½ cents per pound for

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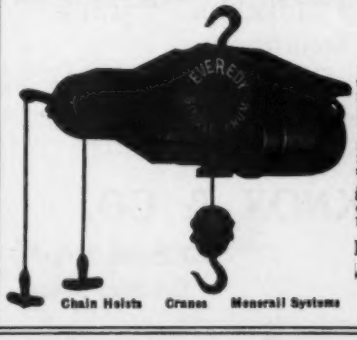
500 lb. Electric Hoist
$225.00



This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.: 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 35 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

READING CHAIN & BLOCK CORP.
READING, PA.
Chain Hoists Cranes Monorail Systems

Six Distinct Divisions

Sulphite Bonds and Ledgers

"K.V.P." (watermarked) Bond, Glendale Bond, Flivver Bond. Each in six colors and white. K.V.P. Ledger—Buff and White.

Ruled Paper Division

K.V.P. Fine Writings and Bonds made up into special and all standard ruled forms for school and commercial uses.

Genuine Vegetable Parchment

The best protection for marketing Dairy Products, Meats, etc., all moist and oily foods. Rolls or flat sizes to meet all needs. Printed or Plain.

Waxed Papers—*Printed or Plain*

Carton and Bread Wrappers—the "Stay Put" kind. Automatic wrapping and lining machine rolls.

Congratulations

to the

American Paper and Pulp Assn.

Fifty-first Anniversary

1878 - 1928

Development Division

Eternally alert for new papers for special purposes. No-Ox-Id (Rust Proof Paper). Whalehide (an indissoluble sheet of wrapping paper).

Good Housekeeping Papers

Shelf and Lining Rolls, 100 ft.—14, 20 and 28 in. wide. Household Parchment—Rolls, 100 ft. long, 12 in. wide. Heavy Waxed Paper—Rolls, 150 ft. long, 12 in. wide. Waxed and Papricloth Specialties. Klothwhite and Drug Bond for Druggist and Stationer.

Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.

WE OFFER
For
INVESTMENT

GREAT NORTHERN PAPER COMPANY

PAPER - PULP - LUMBER - TIMBER
Securities
BOUGHT QUOTED SOLD

H. D. KNOX & CO.

44 Broad Street, New York, N. Y.
27 State Street, Boston, Mass.

1,000,000,000

In 38 years of design and manufacture of water filters and softeners, Hungerford & Terry have installed an aggregate daily capacity of more than one billion gallons.

This experience has enabled them to aid paper and other manufacturers to improve their products and reduce their costs of production by the proper treatment of that important material—water.

Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

HUNGERFORD & TERRY
INC.
CLAYTON, N. J.

New Papers

Writing—	
White rag	15-40
White sulphite	9-30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.25- 8.00
Machine finished	6.15- 8.00
English finished	6.15- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.00-15.00
Newsprint—	
Rolls, contract	3.25- ....
Rolls, transient	3.50- ....
Sheets	3.65- 3.80
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .90
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	4.75- 5.25
Southern kraft	4.25- 4.75
Boards—	New York and Chicago
Solid news	52.50-57.50
Straw	52.50-57.50
Plain chip	45.00-47.50
White coated chip	50.00-55.00
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Chemicals

(*Continued from page 2201*)

shipments in bags, while caustic soda is quoted at 2.90 to 3 cents for the solid product at works.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	4.00 - 4.25
Bleaching powder	2.00 - 2.35
Brimstone (long ton, at mine)	18.00 -20.00
Casein (duty paid)	17.00 -18.00
Caustic soda, spot delivery	2.90 - 3.00
China clay, domestic washed	8.00 -10.00
China clay, foreign	14.00 -20.00
Rosin, Grade E	9.40 - 9.50
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½- ....
Starch, papermakers', in bags	3.32 - ....
Talc (ton)	16.00 -18.00

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities when we will endeavor to furnish actual markets.

BONDS	Bid	Asked
A. P. W. Pulp & Power Co. 7s, 1945	103	
Abitibi Fibre Co. 6s, 1947	100	101¾
Abitibi Power & Paper Co. 6s, 1931	101	102½
Abitibi Power & Paper Co. 6s, 1940	104¾	
Advance Bag & Paper Co. 7s, 1943	104½	
American Sales Book Co. 6s, 1939	102½	
American Writing Paper Co. 6s, 1939	75	78
American Book Co. 6s, 1928	99	101
Beaver Products Co. 7½s	109	111
Beaver Board Co. 8s, 1933	101	
Bedford Pulp & Paper Co. 6½s, 1942	98	100
Belgo-Canadian Paper Co. 6s, 1943	102½	104
British Columbia Pulp & Paper, 6s, 1950	87½	91
Brompton Pulp & Paper 6s, 1935	102	
Brompton Pulp & Paper Co. 6s, 1946	100¾	103
Brown Co. 5½s	101½	103
Canada Paperboard Co. 7s, 1937	98	100
Celotex Co. 6s, 1936		96½
Central Paper Co. 6½s, 1941	86	89
Central Paper Co. 6½s, 1930	87	90
Central Paper Co. 7s, 1932	87	92
Champion Fibre Co. 6s, 1941	100½	101
Champion Paper Co. 6s, 1945	95	98
Champion Coated Paper Co. 6s	100	102
Canada Power & Paper Co. 5½s, 1958	95	97
Columbia River Paper Mills 6s	98	
Defiance Paper Co. 6s, 1939	98	100
Dells Paper & Pulp Co. 6s	95	98
Donnacona Paper Co. 5½s		100
Eastern Manufacturing Co. 7s, 1938	93	95
Escanaba Paper Co. 6s, 1939	96	98
Escanaba Paper Co. 5s, 1928	99	101
Filer Fibre Co. 7s	90	95
Fort William Paper Co. 6s, 1946	101	102
Fraser Co. 6s, 1950	104½	
Fitchburg Paper Co. 5s, 1929	99	
Glatfelter Paper Co. 6s, 1938	104	106
Hammermill Paper Co. 6s, 1939	101½	
Hartje Paper Co. 6s	1½	
Hawley Pulp & Paper 6s, 1946	98	
Hoberg Paper & Fibre Co. 7s, 1937	94½	96½
Howard Smith Paper Co. 7s, 1941	104	106
Industrial Fibre Co. 8s	100	102
Itasca Paper Co. 6s	97	
Itasca Paper & Prairie River 5½s	96	
Jessup & Moore Paper Co. 6s, 1945	85	90
Kalamazoo Vegetable Parchment 6s, 1938	99	101
Mead Fibre Co. 7s, 1937	OW	
Manitoba Paper Co. 6½s	100	103
Mead Fibre Co. 7s, 1937	100	
Munising Paper Co. 6s, 1936	98	
Marathon Paper Mills 5½s, 1942	100	103
Marinette & Menominee Paper Co. 7½s, 1936	103	104½
Mead Pulp & Paper Co. 5s	93	
Mengal Co. 7s, 1934	103	105
Mengal Co. 7s, 1933	101	
Minnesota & Ontario Paper Co. 6s	99½	100½
Missisquoi Pulp & Paper Co. 7s, 1929	99¼	
Missisquoi Pulp & Paper Co. 6s, 1945	99	
Monroe Paper Products 7½s, 1932	97	99
Murray Bay Paper Co. 6½s	103	104
Ontario Pulp & Paper Co. 6s, 1931	108	
Oswego Falls Paper Co. 6s, 1941	99	102
Parker Young Co. 6½s, 1944	99	
Paper & Textile Machinery Co. 7s	100	103
Paterson Parchment Paper Co. 6s, 1938	101	103
Peerless Paper Co. 6s	98	100
Penobscot Chemical Fibre Co. 6s, 1942	102½	104½
Price Bros. 6s, 1943	105	107
Price Bros. 6s, 1932	106	108
Queen City Paper Co. 7s, 1933	98	101
Riordan Pulp & Paper 6s, 1942	102	
Richardson Co. 6s, 1938	100	102
River Raisin Paper Co. 6s, 1936	99	101
Roland Paper Co. 6s, 1937	99	101
St. Anne Paper Co. 6½s, 1946	103	104½

(*Continued on page 2211*)

The B Co. INC. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

KOOS BAC
"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

J. ANDERSEN & CO.
21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

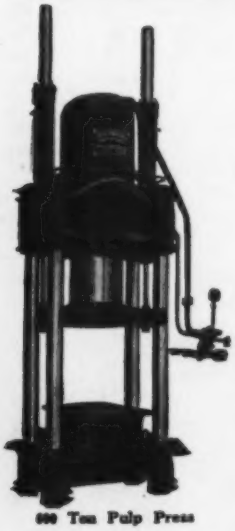
The Pulp and Paper Trading Co.
21 East 40th Street New York City

Dealers in
Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
J. & J. ROGERS COMPANY, Ausable Forks, N. Y.
E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Waysgamack Kraft Pulp
Howard Smith Paper Mills, Montreal, Quebec
EASTERN AGENTS of Sulphite Pulp
Made by Port Huron Sulphite & Paper Co., Port Huron, Mich.

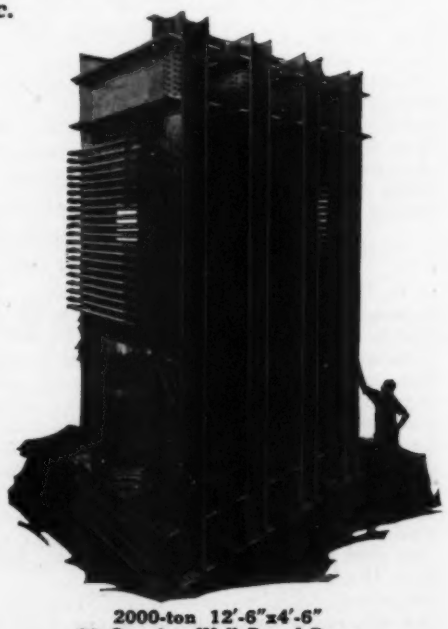
SOUTHWARK

Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.


600 Ton Pulp Press

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.


2000-ton 12'-6"x4'-6"
20 Opening Wall Board Press

SOUTHWARK FOUNDRY and MACHINE CO.
400 WASHINGTON AVENUE
PHILADELPHIA, PA.

CHICAGO
343 S. DEARBORN ST.

AKRON
100 E. SOUTH ST.

EXPORTS

Exports of paper from the United States in the calendar year 1927 showed a slight increase, insofar as the total value of shipments were concerned, over the exportations in 1926, according to official statistics issued by the U. S. Department of Commerce. Last year exports of paper of all kinds from this country reached an aggregate value of $26,975,670, contrasted with shipments of a declared value of $26,829,736 in the preceding year.

However, exports of many of the basic classes of paper in 1927 recorded a marked decline, both as regards quantity and value, as compared with 1926. Exports of newsprint last year totaled 24,657,313 pounds, valued at $1,191,033, against 38,516,147 pounds of a value of $1,849,238 in 1926, while exports of uncoated book paper were 16,040,363 pounds of a value of $1,370,932 last year, against 18,085,094 pounds of a value of $1,721,655 in 1926.

Increases were scored in exports of writing paper, shipments of which amounted to 13,228,375 pounds, valued at $1,918,051 in 1927, compared with 10,406,181 pounds of a value of $1,662,293 in 1926, and in tissue paper, exports of which last year were 4,894,615 pounds of a value of $1,091,531, against 4,400,260 pounds of a value of $1,080,131 in 1926. There was also an appreciable gain in exports of paper boxes and cartons, shipments in 1927 totaling 23,660,747 pounds of a value of $1,627,954, contrasted with 19,865,560 pounds of a value of $1,434,995 in the preceding year. Exports of hanging paper last year increased to 29,390,465 yards, valued at $606,224, compared with 22,141,719 yards of a value of $571,831 in 1926.

Wrapping paper exports last year amounted to 32,312,413 pounds of a value of $2,256,059, against 33,015,471 pounds of a value of $2,234,479 in 1926. Exports of paper board declined in 1927 as contrasted with 1926, shipments of box board amounting to 43,633,581 pounds of a value of $1,351,016 last year, against 52,468,719 pounds of a value of $1,502,045 in 1926, and of other paper board and strawboard to 38,554,831 pounds of a value of $2,072,702, against 40,313,367 pounds of a value of $2,029,696 in 1926. Sheathing and building paper was exported from the United States last year to the amount of 12,756,199 pounds, valued at $501,056, compared with 11,905,501 pounds of a value of $505,958 in 1926.

IMPORTS

Wood Pulp

The market for imported chemical wood pulp is displaying a very firm undertone, and is commencing to reflect to a more pronounced degree the bullish statistical situation which is developing in pulp in Europe owing to the lockout in the Swedish pulp manufacturing industry. Prices are hardening, and in some cases there has been a little actual rise in market value levels; however, consuming demand for pulp from American paper and board mills has been so restricted recently that prices have been given scant opportunity to improve their position.

The situation in Scandinavia is exactly as it was a month ago. The strike of pulp mill workers in Sweden continues, and pulp production in that country is at a standstill excepting in the handful of mills which are independent of the manufacturers' association. Indications are that the shutdown in Sweden will keep up for at least another month, and there is no sign as yet that the labor difficulty will be solved this early. Obviously, with two to three months' Swedish production of pulp out of the market, a firm condition should exist in pulp during the balance of the year. New York importers are of the opinion that prices will rule exceedingly firm for some months to come, and that if market changes develop they will be toward higher levels. Meantime, papermakers are watching the situation carefully but are keeping out of sight as buyers in so far as their requirements will permit, probably figuring that if they should increase their purchasing operations they would run prices up against themselves. The fact should not be lost sight of, however, that every day the lockout in the Swedish industry continues something in the neighborhood of 5,000 tons of sulphite and kraft pulp are being lost to the world market, and thus a statistical condition is being developed which ultimately cannot but have important bearing on the pulp situation.

Imports of chemical wood pulp into the United States during the last calendar year reached a new high level, totaling 1,280,285 long tons, valued at $80,124,449, according to official U. S. Department of Commerce figures, and showing a slight gain over the 1,278,548 tons of a value of $83,208,651 imported in 1926. Imports of mechanical pulp, on the other hand, declined rather sharply last year, amounting to a total of 219,285 long tons, valued at $5,961,821, against 271,213 tons of a value of $8,278,220 imported in 1926. Imports of bleached sulphite last year were 311,130 tons, valued at $24,224,626, compared with 294,818 tons of a value of $23,677,929 in the preceding year, while imports of unbleached sulphite amounted to 613,856 tons, valued at $34,262,845, against 628,923 tons of a value of $37,032,470 in 1926. Imports of unbleached kraft pulp in 1927 were 341,162 tons, valued at $20,684,298, contrasted with 334,803 tons of a value of $21,193,459 imported in the preceding year.

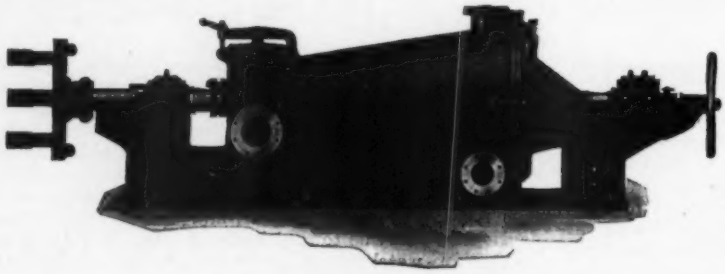
Importers in New York quote prime strong unbleached sulphite at 2.60 cents per pound ex dock at American Atlantic ports, and some grades are quoted well above this level or up to around 2.75 and 2.80 cents. Bleached sulphite of prime quality is on a quotable range of 3.50 to 4 cents a pound on the dock, and some extra brands are beyond 4 cents, while No. 2 unbleached is around 2.45 cents in price, and easy bleaching sulphite 2.85 to 2.90 cents. Prime Swedish kraft pulp is quoted at 2.70 cents per pound ex dock, and prime Scandinavian ground wood at $31 per ton.

Current market quotations ex dock New York and receipts at the port of New York during February follow:

Bleached sulphite, No. 1	3.50- 4.00
Unbleached sulphite, strong No. 1	2.60- 2.80
Unbleached sulphite, No. 2	2.40- 2.50
Easy bleaching sulphite	2.75- 3.00
Mitscherlich unbleached, genuine	2.90- 3.15
Mitscherlich unbleached, ordinary	2.45- 2.60
Kraft, standard Swedish	2.65- 2.80
Ground wood, per ton (dry)	30.00-32.00

Perkins-Goodwin Co., 850 bls. from Oslo; Chemical National Bank, 1,110 bls. from Oslo; Atterbury Bros., 2,000 bls. from Oslo; Pagel, Horton & Co., 1,000 bls. from Hamburg and 2,250 Gefle; Bulkley, Dunton & Co., 537 bls. from Hamburg, 9,875 Stugsund, 2,975 Gefle, 3,500 Iggesund, 4,800 Hernosand, 850 Rotterdam, and 490 Trieste; Scandinavian Pulp Agency, 610 bls. from Gothenburg; E. J. Keller Co., 300 bls. from Rotterdam, 1,012 Hamburg and 1,700 Bremen; Castle & Overton, 1,199 bls. from Rotterdam and 935 Hamburg; Equitable Trust Co., 258 bls. from Hamburg; Chase National Bank, 2,000 bls. from Oslo; M. Gottesman & Co., 2,000 bls. from Sundsvall, 2,000 Sebenico and 1,950 Rotterdam; Johaneson, Wales & Sparre, 2,700 bls. from Sundsvall; American Exchange Irving Trust Co., 735 bls. from Trieste and 200 Hamburg; E. M. Sergeant Co., 150 bls. from Oslo and 175 Gothenburg; Daniel M. Hicks, Inc., 3 bls. from Gothenburg; Buck, Kiaer & Co., 1,200 bls. from Stockholm;

THE No. 3 HERCULES



No. 3 Hercules Jordan—Timken Mounted

with its Timken bearings, sturdy construction and its many unique improvements insures *minimum Jordaning Costs.*

The convenience and efficiency of this time, labor and power saving design will amaze you! Write—

THE HERMANN MANUFACTURING CO.

Lancaster, Ohio

A. H. COX and CO.
Seattle, Wash.

- or -

WATEROUS LTD.
Brantford, Ontario

MITTS & MERRILL GRAVITY FEED SHREDDER

Reduces Paper Stock

Magazines, books, old paper and boxboard, frozen or dried pulp laps run through the Mitts & Merrill Gravity Feed Shredder are reduced to particles which hydrate readily when put into the beaters.

Built in six sizes with spouts ranging from 18" to 45" wide

Reduces Cost

Because shredding in the Mitts & Merrill Gravity Feed Shredder expedites hydration in the beaters there is considerable saving made in power. Thus we see that the shredder here illustrated reduces costs while it is reducing paper stock.

We will be glad to furnish details upon request.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

See pages 368 and 369 in the 1927 Paper and Pulp Mill Catalogue

MITTS & MERRILL 1013 Tilden St. SAGINAW, MICH.

Lagerloef Trading Co., 612 bls. from Helsingfors; J. Andersen & Co., 1,560 bls. from Sarpsborg and 690 Trieste; Borregaard Co., 336 bls. from Sarpsborg; Price & Pierce, 4,050 bls. from Walivik; Order, 920 bls. from Hamburg, 325 Bremen, 3,248 Kotka, 2,697 Helsingfors, 1,903 Hango, 54 Antwerp and 2,650 Oslo.

Paper Stock

Imports of rags for papermaking into the United States in 1927 showed a large decline compared with the preceding year, according to U. S. Department of Commerce statistics. Last year imports of rags totaled 388,107,988 pounds, valued at $7,646,864, contrasted with 476,764,483 pounds of a value of $10,372,689 in 1926. Imports of waste bagging, waste paper, etc., last year amounted to 108,709,769 pounds, against 113,322,087 pounds in 1926, while imports of old rope and all other paper stock reached a total of 65,061,371 pounds, compared with 79,035,894 pounds in the preceding year.

Imports of paper stock other than wood pulp in February, 1928, were comparatively small, judging from receipts through the port of New York. There were some fair-sized shipments of rag stock but the total arrivals were light in comparison with recent months. Receipts of old rope were small also, and not more than normal amounts of old bagging were imported.

Imports of all kinds of paper stock other than wood pulp at New York in February, 1928, these data being taken from manifests of steamers reaching that port during the month follow:

Old Rope—Brown Bros. & Co., 394 rolls, 393 bales and 72 coils; S. Birkenstein & Sons, 37 bls.; Panama Railroad Co., 5 bls.; Ellerman's Wilson Line, 94 coils and 31 bls.; United Fruit Co., 6 bls.; William Steck & Co., 173 coils; T. D. Downing & Co., 22 coils and 50 bls.; E. J. Keller Co., 37 bls.; Order, 23 bls.

Old Bagging—Victor Galaup, Inc., 49 bls.; Royal Manufacturing Co., 174 bls.; Equitable Trust Co., 67 bls.; Chase National Bank, 254 bls.; A. Vermesse, 84 bls.; National City Bank, 391 bls.; E. J. Keller Co., 229 bls.; W. Schall & Co., 685 bls.; Goschens & Cunliffe, 87 bls.; Castle & Overton, 128 bls.; Darmstadt, Scott & Courtney, 278 bls.; Bank of New York & Trust Co., 64 bls.; George W. Millar & Co., 48 bls.; National Park Bank, 134 bls.; Anglo-South American Trust Co., 55 bls.; Order, 320 bls.

Rags—E. J. Keller Co., 460 bls.; George W. Millar & Co., 304 bls.; Salomon Bros. & Co., 253 bls.; Union Waste Co., 15 bls.; Elliott Mills, 52 bls.; Paul Berlowitz, 450 bls.; Castle & Overton, 614 bls.; Victor Galaup, Inc., 158 bls.; Daniel I. Murphy, Inc., 591 bls.; J. Cohen & Son, 46 bls.; American Wool Stock Co., 332 bls.; Evermann & Stern, 18 bls.; E. Butterworth & Co., 36 bls.; E. Burrows, 36 bls.; Darmstadt, Scott & Courtney, 32 bls.; J. Chalfin & Co., 259 bls.; S. Birkenstein & Sons, 286 bls.; Atlas Waste Mfg. Co., 160 bls.; Robert Bishop Mfg. Co., 90 bls.; Katzenstein & Keene, 34 bls.; George Carrizzo, 221 bls.; A. E. Silberman, 14 bls.; Fidelity Trust Co., 83 bls.; Tradesmen's National Bank, 166 bls.; Bank of America, 95 bls.; Hanover National Bank, 82 bls.; Chemical National Bank, 379 bls.; Equitable Trust Co., 414 bls.; Manufacturers Trust Co., 12 bls.; Union Bank & Trust Co., 77 bls.; Philadelphia Girard National Bank, 252 bls.; C. B. Richard & Co., 136 bls.; The Barrett Co., 671 bls.; A. C. Fetteroll, 12 bls.; R. F. Downing & Co., 37 bls.; Brown Bros. & Co., 15 bls.; American Express Co., 68 bls.; A. W. Fenton, Inc., 507 bls.; American Oversea Corp., 203 bls.; Dodwell & Co., 50 lbs.; U. S. Forwarding Co., 117 bls.; Order, 1,185 bls.

Miscellaneous Paper Stock—Alexander H. Searle, Inc., 123 bls.; Goschens & Cunliffe, 110 bls.; Darmstadt, Scott & Courtney, 133 bls.; Daniel M. Hicks, Inc., 242 bls.; Bank of the Manhattan Co., 134 bls.; Milton Snedeker Corp., 69 bls.; Castle & Overton, 867 bls.; Chase National Bank, 273 bls.; Philadelphia Girard National Bank, 157 bls.; New York Trust Co., 567 bls.; Union National Bank of Philadelphia, 86 bls.; Salomon Bros. & Co., 21 bls.; Victor Galaup, Inc., 130 bls.; E. Butterworth & Co., 177 bls.; J. Cohen & Son, 53 bls.; American Exchange Irving National Bank, 373 bls.; C. R. Spence & Co., 376 bls.; Central Union Trust Co., 171 bls.; Bank of New York & Trust Co., 222 bls.; Chemical National Bank, 230 bls.; R. F. Downing & Co., 148 bls.; Royal Manufacturing Co., 43 bls.; Equitable Trust Co., 28 bls.; Fidelity Trust Co., 134 bls.; Burnside & Cooper, 75 bls.; E. J. Keller Co., 744 bls., Riper & Co., 84 bls.; Romeo Canoval & Son, 959 bls.; C. B. Richard & Co., 128 bls.; National City Bank, 106 bls.; Banca Commerciale Italian Trust Co., 90 bls.; Order, 1,853 bls.

Paper

Imports of paper into the United States scored an appreciable increase in 1927 as compared with the preceding year insofar as value was concerned, according to U. S. Department of Commerce statistics which show that the total value of paper of all kinds imported into this country last year was $149,365,343, contrasted with $139,499,144 in 1926. The great bulk of these imports were, of course, newsprint paper from Canada. Total importations of newsprint last year amounted to 3,973,724,113 lbs., valued at $131,488,784, against 3,701,350,149 lbs. of a value of $123,981,715 imported in 1926, of which imports from Canada were valued at $118,731,001 last year and $111,924,211 in the preceding year.

Other important paper imports into the U. S. last year included cigarette paper valued at $4,291,637, against $2,182,-

TRADE MARK

B

Registered

DIAMOND B SPLICING TISSUE

HIGHEST QUALITY

SPECIALLY MADE FOR THE PAPER TRADE

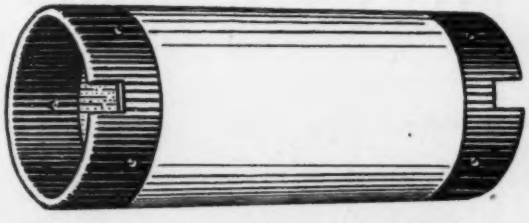
PRICES ON APPLICATION

BEMIS ASSOCIATES INC.

WATERTOWN, MASS.

ELIXMAN PAPER CORE CO., INC.

Corinth, N. Y. U. S. A.



Canadian Elixman Co., Ltd., Hamilton, Ontario

RUSS GELATIN CO.

WORKS—WESTFIELD, MASS.

MANUFACTURERS OF

GELATIN and GLUE

ANIMAL SIZING GLUE STOCK

LARGEST SPECIALISTS IN AMERICA ON

FINE WRITING PAPER SIZING

E. F. RUSS COMPANY 287 Atlantic Avenue BOSTON, U. S. A.

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

PACIFIC SALES COMPANY, Security Bldg., Portland, Ore.

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. BOSTON, MASS.

583 in 1926; tissue paper valued at $1,836,277, against $1,405,192 in 1926; paper boxes valued at $1,446,551, against $964,536 in 1926, and pulp board valued at $1,423,111, against $1,718,425 in 1926.

Paper imports in February were moderately large, judging from arrivals at the port of New York. Imports of all kinds of paper at the port of New York in February, 1928, these data being taken from manifests of steamers reaching that port during the month, follow:

Printing—Walker, Goulard, Plehn Co., 30 bls. from Hamburg, 9 bls. Gothenburg and 124 cs. Bremen; Perry, Ryer & Co., 24 cs. from Glasgow; B. F. Drakenfeld & Co., 61 cs. from Liverpool; New Haven Times-Union, 251 reels and 6 bls. from Gothenburg; P. C. Zuhlke, 229 cs. from Antwerp, Judson Freight Forwarding Co., 25 cs. from Hamburg; E. Dietzgen & Co., 39 cs. from Hamburg and 56 cs. from Rotterdam; Kerr Steamship Co., 29 cs. from Antwerp; Hudson Trading Co., 103 reels from Sundsvall; Perkins-Goodwin Co., 1,044 reels from Hamburg and 622 rolls Bremen; F. Henjes, Inc., 136 reels from Hamburg; J. Henschel & Co., 8 cs. from Hamburg; Oxford University Press, 13 cs. from Liverpool; H. H. Hamburg, 113 pkgs. from Antwerp; National City Bank, 119 bls. from Hamburg; A. S. Zabriskie, 76 reels from Bremen; Martin & Bechtold, 11 cs. from Bremen; Parsons & Whittemore, 462 reels from Kotka; Dingelstedt Co., 10 cs. from Hamburg; H. Reeve Angel & Co., 107 reels and 96 bls. from Helsingfors; Order, 1,104 reels and 164 cs. from Bremen, 182 reels Helsingfors, 51 rolls Hamburg, 34 rolls Oslo and 182 reels Hango.

Wrapping—Manufacturers Trust Co., 8 cs. from Hamburg; Wilkinson Bros. & Co., 63 bls. from Oslo and 5 cs. Rotterdam; Insight Paper Co., 431 reels from Olso; Blauvelt-Wiley Paper Mfg. Co., 497 bls. from Gothenburg and 49 bls. Glasgow; J. P. Heffernan Paper Co., 37 bls. from Gothenburg; National Consumers Paper Co., 11 bls. from Rotterdam; Steiner Paper Corp., 9 cs. from Rotterdam; Birn & Wachenheim, 14 bls. and 10 cs. from Antwerp; E. Dietzgen & Co., 2 cs. from Antwerp and 60 cs. Rotterdam; P. Taubermann, 59 cs. from Antwerp; H. Reeve Angel & Co., 5 cs. from Antwerp; Stelz Bookbinding Co., 3 cs. from Antwerp; F. C. Strype, 45 pkgs. from Antwerp; P. Maguire & Co., 12 cs. from Antwerp; Order, 50 bls. from Antwerp.

Cigarette—Equitable Trust Co., 6 cs. from Trieste; Standard Products Corp., 476 cs. from Havre; P. Lorillard Co., 200 cs. from Marseilles; R. J. Reynolds Tobacco Co., 1,070 cs. from Bordeaux; DeManduit Paper Corp., 481 cs. from Havre and 377 cs. Bordeaux; M. Spiegel & Sons, 34 bls. from Genoa; British-American Tobacco Co., 5 cs. from Liverpool and 10 cs. Havre; J. V. Lago, 4 cs. from Alicante; P. J. Schweitzer, Inc., 105 cs. from Marseilles; Surbrug Co., 20 cs. from Havre; Order, 105 cs. from Trieste, 100 cs. Hamburg and 10 cs. Havre.

Writing—Distinctive Writing Paper Co., 12 cs. from Havre; F. L. Kraemer & Co., 2 cs. from London; Guibont Freres & Co., 27 cs. from Havre.

Filter—H. Reeve Angel & Co., 158 cs. from London; C. Sleicher & Scholl Co., 12 cs. from Hamburg; Manufacturers Trust Co., 51 bls. from Bordeaux; E. Fougera & Co., 80 cs. from Bordeaux.

Drawing—H. Reeve Angel & Co., 10 cs. from London; Keuffel & Esser Co., 2 cs. from Havre, 21 cs. Rotterdam and 32 cs. and 53 rolls Hamburg.

Tissue—Schenkers, Inc., 163 cs. from Hamburg; J. B. Mast & Co., 16 cs. from Genoa; D. C. Andrews & Co., 6 cs. from Liverpool; F. B. Vandegrift & Co., 24 cs. from Liverpool; Baldwin Universal Co., 5 cs. from Liverpool.

Hanging—F. J. Emmerich & Co., 70 bls. from London, 66 bls. Hamburg, 129 bls. Liverpool and 29 cs. Havre; C. A. Haynes & Co., 260 pkgs. from London and 17 bls. Liverpool; Stern, Steiner & Co., 5 bls. from Hamburg; A. C. Dodman, Jr. & Co., 161 bls. from Liverpool, 23 pkgs. Southampton and 6 cs. Havre; W. H. S. Lloyd & Co., 16 pkgs. from Liverpool; Panama-Pacific Line, 30 pkgs. from London; F. Blank & Co., 2 cs. from Hamburg; Gallagher & Ascher, 5 bls. from Hamburg; G. J. Hunken & Co., 16 pkgs. from Hamburg; Globe Shipping Co., 17 pkgs. from Hamburg, J. E. Bernard & Co., 37 pkgs. from Antwerp; F. A. Binder, 57 bls. from Bremen.

Photo—Globe Shipping Co., 12 cs. from Rotterdam and 393 cs. Bremen; P. C. Zuhlke, 259 cs. from Antwerp and 9 cs. Rotterdam; Gevaert Co. of America, 289 cs. from Antwerp and 108 cs. Rotterdam; Medo Photo Supply Co., 6 cs. from London; J. H. Schroeder Banking Corp., 2 cs. from Bremen; J. J. Gavin & Co., 9 cs. from Liverpool; American Express Co., 15 cs. from Antwerp.

Board—C. K. McAlpine & Co., 20 lbs. from Gothenburg; Perkins-Goodwin Co., 980 rolls from Rotterdam; Adrian Vuyck, 2,215 reels from Rotterdam; Robert Wilson Paper Corp., 202 reels from Rotterdam; G. M. Thurnauer Co., 16 cs. from Antwerp; A. B. Massa Paper Corp., 720 pkgs. from Rotterdam; C. B. Hewitt & Bros., 5 bls. from Antwerp; F. Bing, Inc., 30 bls. from Bremen; H. H. Ayer, Inc., 2 cs. from Havre; M. J. Corbett & Co., 12 cs. from Hamburg; Bourjois Co., 29 pkgs. from Havre; Haas Bros. 314 reels from Rotterdam; J. P. Heffernan Paper Co., 154 reels from Rotterdam; State Bank, 267 reels from Rotterdam; Edition Bookbinders Co., 219 pkgs. from Rotterdam; Lagerloef Trading Co., 96 bls. from Bremen and 4 cs. Kotka; Chatham & Phenix National Bank, 44 bls. from Gothenburg; Premier Flong Co., 61 cs. from Hamburg; C. Bergeret, 14 cs. from Marseilles; Order, 86 reels from Hamburg and 307 reels Rotterdam.

Miscellaneous—Whiting-Patterson Co., 27 cs. from London and 36 cs. Southampton; S. Gilbert, 8 cs. from Hamburg and 16 cs. Rotterdam; Brown Bros. & Co., 8 cs. from Hamburg; Southern Pacific Co., 23 bls. from Gothenburg and 3 cs. Havre; A. Stauff & Co., 100 bls. from Gothenburg; J. A. Raber, 220 bls. from Gothenburg; E. M. Sergeant Co., 6 cs. from Gothenburg; Keller-Dorian Paper Co., 130 cs. from Havre; Judson Freight Forwarding Co., 14 cs. from Havre and 10 cs. Hamburg; Coenca-Morrison Co., 8 cs. from Havre; D. C. Andrews & Co., 12 pkgs. from Havre; Eleto Co., 12 pkgs. from Havre; Japan Paper Co., 9 cs. from Rotterdam, 7 cs. Havre, 12 cs. Marseilles and 2 cs. Barcelona; Heemsoth, Basse & Co., 4 cs. from Antwerp; B. Meiners, 5 cs. from Canton; Baldwin Shipping Co., 7 cs. from Hamburg; Louis Dejonge Co.,

Setting the Standard for Over 80 Years

For over 80 years Fitchburg has been setting the standard for dryer felts. Over 80 years' experience has shown how to get that smooth, tightly woven surface that leaves no felt marks in the paper. It has shown us how to weave a strong, durable cotton duck felt that will last longer and with less down time for a broken felt. Paper makers who once use Fitchburg felts never use anything else.

There is a Fitchburg Cotton Dryer Felt for every paper—for fine ledger or bond, book or coarse papers. They are manufactured in English weave in two, three, four, five and six ply, from 60 to 210 inches in width.

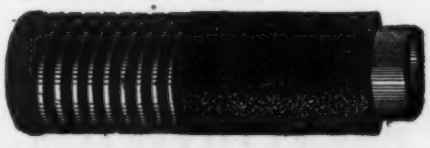
When next thinking of dryer felts, think of "Fitchburg".

FITCHBURG DUCK MILLS

ESTABLISHED 1844

54 Duck Mill Road FITCHBURG, MASS.

Pressure Pipe That Never Bursts



Wyckoff Wood Pipe

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained.

Built in sizes 1 inch to 48 inches.

Write today for catalog and prices

A. WYCKOFF & SON COMPANY

1855 Elmira, N. Y., U. S. A. 1928

Morey Paper Vulcan TRADE MARK **Mill Supply Co.**

99 CHAUNCY St. BOSTON, MASS.

Sole Selling Agents

"LAMBETH" COTTON TRANSMISSION ROPE
and EGYPTIAN COTTON ROPE FOR SHEAHAN CARRIERS
Careful, Intelligent, Quick Service

You Can't Spell "PERFECTION" Without a "P"

Neither Can You Obtain It Without the Right Type of Roll---Ours Is the Right Type

STOWE & WOODWARD COMPANY
The Rubber Roll Makers
NEWTON UPPER FALLS, MASS., U. S. A.

Fourdrinier Wires of Known Quality

You'll find our Fourdrinier wires honestly made, by skilled craftsmen who take a justifiable pride in producing a high **quality** product.

That's why so many paper makers find them so satisfactory, and use them exclusively.

Quality, also, is the dominant feature of our Cylinder Moulds, Dandy Rolls, and Wire cloth of Brass, Bronze, Monel and Steel.

CHENEY BIGELOW WIRE WORKS
Established 1842
Springfield, Mass.

28 cs. from Hamburg; C. A. Johnson & Co., 38 cs. from Liverpool; Whitfield Paper Works, 50 cs. from Kobe and 50 cs. Tientsin; Y. Yabuki, 17 cs. from Kobe; Steiner Paper Corp., 3 cs. from Kobe and 10 cs. Rotterdam; H. Reeve Angel & Co., 5 cs. from Yokohama and 4 bls. Bremen; P. H. Petry & Co., 21 bls. from Bremen and 8 cs. Rotterdam; Tice & Lynch, 2 cs. from Havre; Freedman & Slater, 3 cs. from Hamburg; Hensel, Bruckman & Lorbacher, 32 cs. from Havre and 65 cs. Bremen; F. Murray Hill, Inc., 14 cs. from Bremen; G. W. Sheldon & Co., 7 cs. from Havre; Borden & Riley Paper Co., 7 cs. from Antwerp; Charles W. Williams & Co., 26 cs. from Antwerp; F. L. Kraemer & Co., 14 cs. from Bremen; Steffens, Jones & Co., 4 cs. from Rotterdam and 5 cs. Kobe; J. J. Shore & Co., 17 cs. from Rotterdam; International Forwarding Co., 104 rolls from Rotterdam and 8 cs. Hamburg; F. Prinzing, 25 cs. from Canton; J. C. Rebold & Co., 9 cs. from Liverpool; American Exchange Irving Trust Co., 20 cs. from Hamburg; R. F. Downing & Co., 5 cs. from Havre and 33 pkgs. London; Causon & Montgolfer, 18 cs. from Havre; J. Rickhard & Co., 13 cs. from Rotterdam; Central Union Trust Co., 10 cs. from Hamburg; Kolesch & from Havre; J. Langsdorf & Co., 5 cs. from Hamburg.
Tiffany & Co., 6 cs. from Havre; Robert Wilson Paper Corp., 3 cs. Co., 5 cs. from Rotterdam; Danley & Co., 11 cs. from Havre;

Market Quotations

(*Continued from page 2203*)

BONDS	BID	ASKED
St. Croix Paper Co. 5s, 1928	99	
St. Helens Pulp & Paper Co. 6½s, 1941	99	
St. Lawrence Paper Mills 6s, 1946	102¼	104
St. Regis Paper Co. 6s, 1931	101	102½
St. Lawrence Pulp & Lumber Co. 6s, 1933	7	
Spruce Falls Power & Paper Co. 5½s		100
Spanish River Pulp & Paper 6s, 1931	107	
Stevens & Thompson Paper Co. 6s, 1942	93	94
Southern Advance Bag & Paper Co. 6s, 1947	96	
Taggart Bros. 6s, 1944	95	100
Tait Paper & Color Industries 6s	85	95
Ticonderoga Pulp & Paper 6s, 1940	100	102
Tomahawk Craft Paper Co. 7s, 1928	97	
Tonawanda Paper Co. 5½s	99	101
United Wall Paper 6s, 1947	96	98
Watab Paper Co. 6½s, 1942	102	104
Whitaker Paper Co. 7s, 1942	107½	
Waterway Paper Products 6s, 1931	99	101
Westfield River Paper Co. 7s	89	93
Warren (S. D.) 6s, 1945	103½	
Wayagamack Pulp & Paper Co. 6s, 1951	103	105
Wm. Whitmer Sons—Parsons Pulp & Lbr. 8s	15	20

STOCKS	Bid	Asked
American Book Co. Common	154	159
American Sales Book Co. Pfd.	107	109
American Sales Book Co. Common	74	76
American Tissue Mills Pfd.	90	
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Preferred	90	
British Columbia Pulp & Paper Common	4	8
British Columbia Pulp & Paper Pfd.	65	
Brompton Pulp & Paper Co. Common	56	59
Champion Fibre Co. Pfd.	107½	
Champion Coated Paper Co.		125
Champion Coated Paper Co. Pfd.	105	107
Chemical Paper Mfg. Co. 1st Pfd.	90	
Chillicothe Paper Co. Pfd.		105
De Jonge (Louis) Co. Pfd.	95	97
Dryden Paper Co. Pfd.	40	45
Diem & Wing Pfd.	92	97
Downington Paper Co. Pfd.	101	
Donnacona Paper Co. Pfd.	103	
Donnacona Paper Co. Common	93	
Eastern Manufacturing Co.	38	
Eddy Paper Co. Common	30	
Escanaba Paper Co. Pfd.	40	
Fidalgo Pulp Mfg. Co. Common	75	
Glatfelter Paper Co. Pfd.	103	107
Great Northern Paper Co.	74	76
Hawley Paper Co. Pfd.	96	
Hammermill Paper Mills Pfd.	109	
Holyoke Card & Paper Pfd.	170	
Hinde & Dausch Co. Pfd.	103	
Indiana Flooring Co. Common		7
International Pulp Co. Pfd.	74	
International Textbook Co.	25	27
International Paper Co. Pfd.	106	
Jessup & Moore Paper Co. 1st Pfd.	38	45
Jessup & Moore Paper Co. Common	5	
Marathon Paper Mills Common	125	
Minnesota & Ontario Paper Co. Pfd.	75	80
Missisquoi Pulp & Paper Co. Pfd.	93	98
Munising Paper Co. Pfd.	80	90
Munising Paper Co. Common	20	30
Morris Paper Co. Units	150	
Northern Paper Mills Co.	30	
National Paper & Type Co. Pfd.	77	83
Oglesby Paper Co. Pfd.	101½	
Occident Paper Co. Pfd.		20
Oxford Paper Co. Pfd.	109½	110½
Oxford Paper Co. Common	170	180

Starch

ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

Corn Products Refining Company
17 Battery Place New York

Starch

1864 1928

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

BOLTON QUALITY

JOHN W. BOLTON & SONS, INC.

EAGLE KNIFE & BAR WORKS

LAWRENCE, MASS.

The only firm making KNIVES for every machine from wood pile to finishing room.

It's the KNIVES that do the work!

UNION SCREEN PLATE CO.

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

Union Bronze Screen Plates

(Best phosphorised Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge

UNION BRONZE SCREWS for Screen Plates

Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented

THE ORIGINAL THE BEST

SCRANTON

Centrifugal

Steam Triplex Plunger

Vacuum Pumps Jet Condensers

Manufactured by

The Scranton Pump Co., Scranton, Pa.

PUMPS

Pickles' Patent Automatic Steam Regulator FOR Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

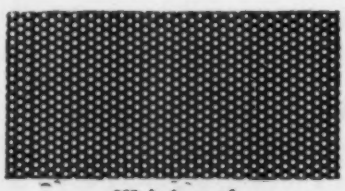
W. F. PICKLES Buckland, Conn.

HARDY BRONZE

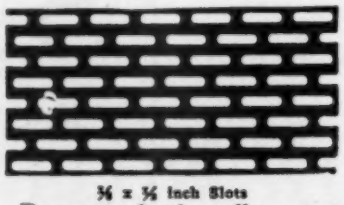
SCREEN PLATES
ACID RESISTING
VALVES

Wm. A. Hardy & Sons Co.
Fitchburg, Mass.

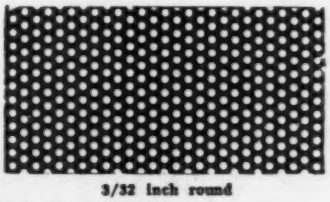
Perforated Metal Screen for Pulp and Paper Mills



.065 inch round



¾ x ⅛ inch Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS, 57-65 Fairmount Ave., Jersey City, N. J.

Parker Young Co. Pfd	76	
Port Alfred Pulp & Paper Common	112	
Port Alfred Pulp & Paper Pfd	105	
Penobscot Chemical Fibre Co. Common	75	85
Price Bros. Common	85	
Price Bros. Pfd	104	
Package Paper & Supply Units	22	
River Raisin Paper Pfd	10	12
Robertson Paper Co. Pfd	6	
Rogers Paper Co.	45	50
Richardson Common	195	197
Smith (Howard) Paper Co. Pfd	114	
Smith (Howard) Paper Co. Common	83	
Sorg (Paul) Paper Co. Pfd	100	
Sorg (Paul) Paper Co. Common		OW
St. Regis Paper Co. Pfd	104	105½
St. Croix Paper Co. Common	160	170
West Virginia Pulp & Paper Common	50	53
West Virginia Pulp & Paper Pfd	102	104
West Virginia Timber Co. Pfd	90	96
Watervliet Paper Co	10	20
Watson (H. P.) Paper Co	125	
Wayagamack Paper Co	110	

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 29306—Kraft, account-book, newsprint and tissue papers. Bombay, India. Purchase and agency desired.

No. 29355—Pulp board for egg case fillers. Hamburg, Germany. Purchase desired.

No. 29356—Wall paper, cheap and medium-priced. Tallinn, Estonia. Purchase and agency desired.

No. 29451—Paper bag making machinery. Pernambuco, Brazil. Purchase desired.

No. 29458—Book and writing papers, and envelopes. Penang, Straits Settlements. Agency desired.

No. 29441—Paper boxes, shoe; and wrapping and tissue papers. San Jose, Costa Rica. Purchase desired.

No. 29450—Cardboard, pasted. San Juan, Porto Rico. Purchase desired.

No. 29452—Newsprint paper. Bagdad, Iraq. Purchase desired.

No. 29453—Paper gumming and cutting machines, and label-gumming machines. Durban, South Africa. Purchase desired.

No. 29454—Paper, printing and writing, cheap. Benares, India. Purchase and agency desired.

No. 29456—Wall paper. Catania, Italy. Agency desired.

No. 29457—Writing paper, envelopes and correspondence cards. Santo Domingo, Dominican Republic. Agency desired.

No. 29407—Writing paper and envelopes. Hong Kong, China. Purchase and agency desired.

No. 29537—Bags and wrapping paper. San Juan, Porto Rico. Sole agency desired.

No. 29535—Paper. Stuttgart, Germany. Purchase and agency desired.

No. 29583—Vulcanized fiber ceilings and bath tile, and wall board in colors. Dresden, Germany. Purchase desired.

No. 29536—Wall paper. Palermo, Italy. Agency desired.

No. 29503—Wrapping paper, cheap, in rolls and reams. San Juan, Porto Rico. Purchase and agency desired.

No. 29743—Newsprint, writing and wrapping papers. Mazatlan, Mexico. Agency desired.

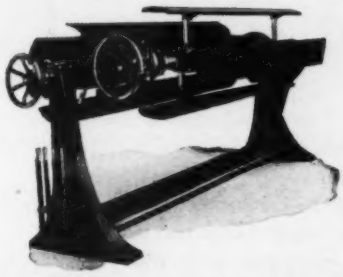
No. 29741—Pattern board. Barcelona, Spain. Purchase desired.

No. 29659—Pulp and paper making materials. Lahore, India. Agency desired.

No. 29745—Writing paper, bond, and flat and boxed envelopes. Cordoba, Argentina. Purchase and agency desired.

No. 29644—Caustic soda. Hamburg, Germany. Agency desired.

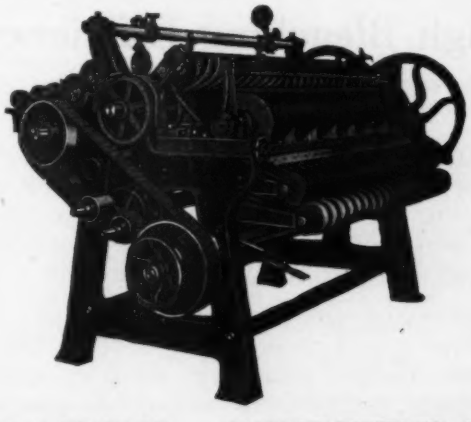
The Hill Clutch Machine & Foundry Co., Cleveland, O., has been awarded the contract for complete agitator drives to be installed in the enlarged plant of the Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.



IMPROVED AUTOMATIC COLLAPSING REEL

One of several designs used by Paper Manufacturers and converters. We design and manufacture Toilet Winders, Napkin Folders, Crepe Machines, Package Presses and other equipment for the Paper Converter and manufacturer. Send us your specifications. Write for catalogue.

Hudson-Sharp Machine Co.
GREEN BAY, WISCONSIN
Chicago Office: 574 Wrigley Bldg.
Manufacturers and Designers of Special Machinery



PAPER CUTTERS

Single—Duplex—Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

HAMBLET MACHINE CO.
LAWRENCE, MASS.

6 Advantages

GREATLY reduces length of belting required; saves floor space; saves bearings; saves on motor costs; reduces power consumption; and—the generally rugged construction and idler pulley equipped with Ball Bearings insure long service and low upkeep costs.

Savings on any *one* of the first five points will go a long way toward paying the first cost of a U. G. Contactor—long and continuously efficient service is where the real profits come in.

There's a special circular about the U. G. Automatic Belt Contactor; may we send it?

T. B. Wood's Sons Co.

Chambersburg, Pa.

Makers of Shafting, Hangers, Couplings, Rope Drives, Pulleys, Friction Clutches, Pillow Blocks, Speed Reducers, Conveyors and Ball Bearings.

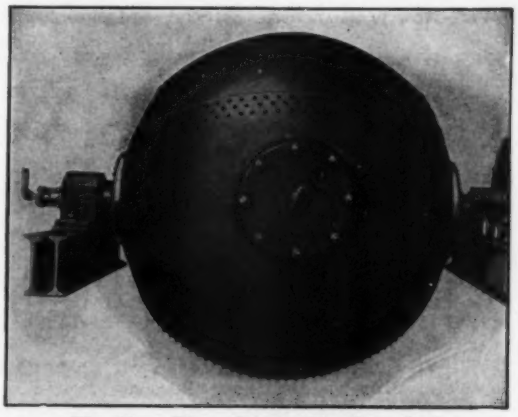
The U. G. Automatic Belt Contactor

High Bleaching Efficiency at Low Cost

HIGH bleaching efficiency, low power and chemical consumption and effective agitation make the improved Biggs Rotary Bleaching Engine the most economical method of bleaching pulp yet devised.

Concentrated solution under pressure, cold, bleaches consistencies up to 35% in the improved Biggs Bleaching Engine quickly, uniformly and without damage to the fibre.

Biggs Digesters and Boilers are also characterized by low operating and maintenance expense. The complete story is told in the Biggs Rotary Boiler Book sent promptly on request.



The New Biggs Rotary Bleaching Engine (Patents Pending)

THE BIGGS BOILER WORKS COMPANY

General Offices and Works
Akron, Ohio

Eastern Sales Office: 300 Madison Ave., New York
Western Sales Office: 35 South Dearborn St., Chicago

BOILER WORKS · The Biggs · CO. · AKRON OHIO · EST. 1882

Trade Mark Registered

GLOBE and CYLINDER

ROTARY BLEACHING BOILERS

for Years of Dependable Cooking and Bleaching

Buyers' Guide—What and Where to Buy

Equipment, Apparatus, Supplies and Raw Materials Used by the Paper Industry

Adhesives
Corn Products Refin'g Co.
E. F. Russ Co.
Acid Resisting Bronze
Eastwood Wire Mfg. Co.
William A. Hardy & Sons.
Agitator Equipment
The Biggs Boiler Wks. Co.
Hill Clutch M. & F. Co.
Manitowoc Engrg. Wks.
Mid-West Machine Co.
Moore & White Co.
Noble & Wood Mach. Co.
Riter-Conley Co.
The Shartle Bros. M. Co.
John Waldron Corp.
Air Compressors
Sullivan Machinery Co.
J. T. Ryerson & Son, Inc.
Air Compressors (Cont.)
Allis-Chalmers Co.
General Electric Co.
Air Cond'g & Control App.
W. B. Connor Co., Inc.
J. O. Ross Eng. Corp.
Air Dryers and Heaters
J. O. Ross Eng. Corp.
John Waldron Corp.
Air Lift Well Systems
Sullivan Machinery Co.
Air Preheaters
Combustion Eng. Corp.
Foster Wheeler Corp.
Wheeler Condenser & Eng. Co.
Air Presses
Gibbs-Brower Co.
Air Washers
W. B. Connor Co., Inc.
J. O. Ross Eng. Corp.
Alum
Merrimac Chemical Co.
Alkali
Diamond Alkali Co.
The Mathieson Alkali Works
Solvay Process Co.
Angle Valves
Eastwood Wire Mfg. Co.
Aprons (Fourdrinier)
The B. F. Goodrich Rubber Co.
Morey Paper Mill Supply Co.
Architects
James L. Carey.
Ferguson Engineers.
Hardy S. Ferguson.
George F. Hardy.
V. D. Simons.
Ash Conveyors
Combustion Eng. Corp.
Ash Testers
Foreign Paper Mills, Inc.
Assorting Tables
Moore and White Co.
Autoclaves
The Biggs Boiler Wks. Co.
Manitowoc Eng. Works.
Riter-Conley Co.
Babbitt Metal
Eastwood Wire Mfg. Co.
Jos. T. Ryerson & Son, Inc.
Barkers
Green Bay Barker Mach. & Tool Works.
William Hamilton Ltd.
Holyoke Mach. Co.
Barking Drums (Paulson)
Manitowoc Engine Works.
Bearings
Jeffrey Mfg. Co.
The Hill Clutch Mach. & Fdy. Co.
S K F Industries, Inc.
T. B. Wood Sons Co.
Bearings (Babbitt)
Jos. T. Ryerson & Son, Inc.
Bearings (Ball)
S K F Industries, Inc.
Bearings (Cutless Rubber)
B. F. Goodrich Rubber Co.
Hill Clutch Mach. & Fdy. Co.
Bearings (Roller)
Hyatt Roller Bearing Co.
Link-Belt Company.
Rollway Bearing Co., Inc.
S K F Industries, Inc.
Timken Roller Bearing Co.
Bearings (Tapered Roller)
Timken Roller Bearing Co.
Bearings (Thrust)
Timken Roller Bearing Co.
Beaters (Continuous)
The Shartle Bros. Machine Co.
Beater Rolls
Emerson Mfg. Co.
The Mid-West Mach. Co.
Noble & Wood Machine Co.
Chlorine (Liquid)
Electro Bleaching Gas Co.
Mathieson Alkali Wks., Inc.
Penn. Salt Mfg. Co.
Beater Bed Plates
The Dayton Beater & Hoist Co.
The Mid-West Mach. Co.
Noble & Wood Machine Co.
Beater Fly Bars
The Dayton Beater & Hoist Co.
The Mid-West Mach. Co.
Noble & Wood Machine Co.
Beater Valves
The Dayton Beater & Hoist Co.
The Mid-West Mach. Co.
Beating, Washing and Bleaching Engines
Dayton Beater & Hoist Co.
Dilts Mach. Works, Inc.
Emerson Mfg. Co.
Gibbs-Brower Co.
Holyoke Mach. Co.
E. D. Jones & Sons Co.
Mid-West Machine Co.
Noble & Wood Mach. Co.
Port Arthur Shipbuilding Co.
Beating Testers
Foreign Paper Mills, Inc.
Belt Dressing
Graton & Knight Co.
Stephenson Mfg. Co.
Belt Drives
Hill Clutch Mach. & Fdy.
The Jeffrey Mfg. Co.
Link-Belt Company.
F. L. Smidth & Co.
T. B. Wood's Sons Co.
Belt Fasteners
Crescent Belt Fastener Co.
Belt Lacing
The Bristol Co.
Graton & Knight Co.
Schieren Co., Chas. A.
Belting
Morey Paper Mill Supply Co.
Belting (Leather)
Chicago Belting Co.
Graton & Knight Co.
J. E. Rhoads & Sons.
Schieren Co., Chas. A.
I. B. Williams & Sons.
Belting (Rubber)
Cincinnati Rubber Mfg. Co.
B. F. Goodrich Rub. Co.
Morey Paper Mill Supply Co.
New York Rubber Corp.
Quaker City Rubber Co.
Belting (Silent Chain)
Link-Belt Company.
Bindersboard Machines
Gibbs-Brower Co.
Noble & Wood Mach. Co.
Blotting Paper Testers
Foreign Paper Mills
Bleaching Boilers
The Biggs Boiler Works Co.
Manitowoc Eng. Works.
Bleaching Powder
The Mathieson Alkali Works.
Pennsylvania Salt Mfg. Co.
Bleaching (Propellers)
Moore and White Co.
Bleaching Units (Pulp)
Pulp Bleaching Corp.
Blowers
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.
Jos. T. Ryerson & Son, Inc.
Blowers (Centrifugal)
General Electric Co.
Blow-Off Valves
Eastwood Wire Mfg. Co.
The Lunkenheimer Co.
Rice, Barton & Fales, Inc.
Blow Pipes (Water Jacketed)
Manitowoc Eng. Works.
Board Machines
Beloit Iron Works.
Black-Clawson Co.
Gibbs-Brower Co.
Rice, Barton & Fales, Inc.
Board Scales
Foreign Paper Mills, Inc.
Boilers (Steam)
Combustion Eng. Corp.
Edge Moor Iron Co.
Heine Boiler Co.
Ladd Water Tube Boiler Co.
Manitowoc Eng. Works.
Boilers (Waste Heat)
Edge Moor Iron Co.
Boiler Blow-off Apparatus
The Permutit Co.
Boiler Feeders
W. B. Connor Co., Inc.
Boiler Mountings
The Lunkenheimer Co.
Boiler Tubes & Fittings
Jos. T. Ryerson & Son, Inc.
Brass Wire Cloth
Appleton Wire Works.
Wm. Cabble Excelsior Wire Mfg. Co.
Cheney Bigelow Wire Works.
Eastwood Wire Mfg. Co
Lindsay Wire Weaving Co.
W. S. Tyler Co.
Breechings
Heine Boiler Co.
Bronze Castings
Eastwood Wire Mfg. Co.
Buckets (Elevator)
The B. F. Goodrich Rubber Co.
The Jeffrey Mfg. Co.
Link-Belt Company.
Bundling Presses
Hudson-Sharp Mach. Co.
Paper Converting Mach. Co.
Burrs
F. W. Roberts Mfg. Co.
Calenders
Beloit Iron Works.
H. W. Butterworth & Sons Co.
Dominion Engineer. Wks., Ltd.
Downington Mfg. Co.
Farrel - Birmingham Co., Inc.
Gibbs-Brower Co.
Holyoke Mach. Co.
Lobdell Car Wheel Co.
B. F. Perkins & Son, Inc.
Smith & Winchester Mfg. Co.
John Waldron Corp.
Calender Doctors
Beloit Iron Works.
Rice, Barton & Fales, Inc.
Calender Rolls
H. W. Butterworth & Sons Co.
Farrel-Birmingham Co., Inc.
Gibbs-Brower Co.
Lobdell Car Wheel Co.
B. F. Perkins & Son, Inc.
Calender Roll Grinders
Farrel -Birmingham Co. Inc.
Lobdell Car Wheel Co.
Car Pullers
Swenson Evaporator Co
Casein
Kalbfleisch Corp.
John Regnier & Son Co.
Western Paper Makers Chem. Co.
Castings (Brass)
Eastwood Wire Mfg. Co.
Noble & Wood Mach. Co.
Smith & Winchester Mfg. Co.
Castings (Grey Iron)
Beloit Iron Works.
Hill Clutch Mach. & Fdy. Co.
Link-Belt Company.
Jeffrey Mfg. Co.
Noble & Wood Mach. Co.
Smith & Winchester Mfg. Co.
Castings (Malleable Iron)
Timken Roller Bearing Co.
Castings (Steel & Semi-Steel)
Link-Belt Company.
The Lunkenheimer Co.
Caustic Soda
Diamond Alkali Co.
The Mathieson Alkali Works.
Solvay Process Co.
Chains
The Jeffrey Mfg. Co.
Link-Belt Company.
Joseph T. Ryerson & Son, Inc.
Chain Drives
Grant Gear Works.
The Jeffrey Mfg. Co.
Link-Belt Company.
Morse Chain Co.
Chemicals
Diamond Alkali Co.
Kalbfleisch Corp., The
The Mathieson Alkali Works.
Solvay Process Co.
Western Paper Makers' Chem. Co.
Chippers
Gibbs-Brower Co.
Holyoke Mach. Co.
Rice, Barton & Fales, Inc.
Ryther & Pringle Co.
Clays and Fillers
Edgar Brothers Company
English China Clays Sales Corp.
Kalbfleisch Corp.
Clay Mixers
Manitowoc Eng. Works.
Cleaning Material
Oakite Products, Inc.
Coal Bunkers
Link-Belt Company.
Coal & Ash Handling Systems
The Jeffrey Mfg. Co.
Link-Belt Company.
Coal Pulverizers
Combustion Eng. Corp.
Coating Machines
Gibbs-Brower Co.
John Waldron Corp.
Cocks
Eastwood Wire Mfg. Co.
The Lunkenheimer Co.
Concrete Reinforcing Steel
Joseph T. Ryerson & Son, Inc.
Conditioning Ovens (Pulp)
Foreign Paper Mills, Inc.
Consulting Engineers
Henry Black
James L. Carey.
Hardy S. Ferguson.
Ferguson Engineers.
George F. Hardy.
V. D. Simons.
Consult'g Engineers (Pow.)
Ferguson Engineers.
V. D. Simons.
Conveyors
Allis-Chalmers Co.
John Inglis Co., Ltd.
The Jeffrey Mfg. Co.
Link-Belt Company.
Conveyors (Belt)
The B. F. Goodrich Rubber Co.
The Jeffrey Mfg. Co.
Link-Belt Company.
Corduroy Wire Cloth
The W. S. Tyler Co.
Cores
Elixman Paper Core Co.
Cores (Collapsible)
Smith & Winchester Mfg. Co.
Corrugated Steel Sheets
Joseph T. Ryerson & Son, Inc.
Couch Rolls
Dominion Eng. Wks., Ltd.
Rodney Hunt Mach. Co.
The Moore & White Co.
The Paper & Textile Machinery Co.
Couplings
Wm. Ganschow Co.
Hill Clutch Mach. & Fdy. Co.
D. O. James Mfg. Co.
Link-Belt Company.
Terry Steam Turbine Co.
John Waldron Corp.
T. B. Wood Sons Co.
Cranes (Crawling Tractor)
Link-Belt Company.
Cranes (Dipper Arm)
Am. Hoist & Derrick Co.
Link-Belt Company.
Cranes (Electric)
The Chisholm-Moore Mfg. Co.
Link-Belt Company.
Roeper Crane & Hoist Works, Inc.
Swenson Evaporator Co.
Cranes (Hand Power)
The Chisholm-Moore Mfg. Co.
Roeper Crane & Hoist Works, Inc.
Swenson Evaporator Co.
Cranes (Locomotive)
Am. Hoist & Derrick Co.
Link-Belt Company.
Creosoting Cylinders
Biggs Boiler Works Co.
Manitowoc Eng. Wks.
Crepe Machines
Gibbs-Brower Co.
Hudson-Sharp Mach. Co.
Crushers (Coal and Coke)
The Jeffrey Mfg. Co.
Cutters
Beloit Iron Works.
Cameron Machine Co.
Holyoke Mach. Co.
Smith & Winchester Mfg Co.
Cylinder Machines
Bagley & Sewall Co., Inc.
Beloit Iron Works.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Rice, Barton & Fales, Inc.
The Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.
Cylinder Molds (New or Repaired)
Appleton Wire Works.
Beloit Iron Works.
Cheney Bigelow Wire Works.
Eastwood Wire Mfg. Co.
Gibbs-Brower Co.
Glens Falls Mach. Works.
Improved Paper Mach. Co.
The Lindsay Wire Weaving Co.
The W. S. Tyler Co.
Dampeners
B. F. Perkins & Son, Inc.
Damper Regulators (Automatic)
Eastwood Wire Mfg. Co.
Dandy Rolls
Appleton Wire Works.
Cheney Bigelow Wire Works.
Eastwood Wire Mfg. Co.
Lindsay Wire Weaving Co.
The W. S. Tyler Co.
Deckers and Washers
Improved Paper Mach. Co.
Oliver Cont. Filter Co.
United Filters Corp.
Deckle Straps
Stowe & Woodward Co.
Densometers
Foreign Paper Mills, Inc.
Die Presses
Smith & Winchester Mfg. Co.
Diffusers
Manitowoc Eng. Works.
Digesters
The Biggs Boiler Wks. Co.
Manitowoc Eng. Works.
Riter-Conley Co.
Digester Covers
Eastwood Wire Mfg. Co.
Doctor Blades
B. F. Goodrich Rub. Co.
Rice, Barton & Fales, Inc.
Drainage Systems (Dryer)
Farnsworth Co.
The Fulton Eng. Co.
Stickle Steam Specialties Co.
Drum Winders (Drives)
Beloit Iron Works.
Gibbs-Brower Co.
John Waldron Corp.
Dry & Pulp Colors
Geo. S. Mepham Co.
Vera Chem. Corp.
Western Paper Makers Chem. Co.
C. K. Williams & Co.
Dryers
Beloit Iron Works.
Smith & Winchester Mfg Co.

Lindsay Spiral Weave Fourdrinier Wires

(Patented Oct. 1927)

Represent the latest idea in paper machine wire cloth.

They prevent grooving of Suction Boxes, scoring and filling up of seams. This overcomes the necessity of planing the suction box covers and adds to the life and tonnage of the wires.

Lindsay Wire Weaving Company

Collinwood Station CLEVELAND, OHIO

OUR TENAX FELTS ARE THE SENSATION

OF THE

PAPER INDUSTRY THE WORLD OVER

NONUSERS ARE THE LOSERS

LOCKPORT FELT CO.

NEWFANE, NEW YORK

Dryers (Heavy Board)
Cox Mfg. Co.
Dryers (Rotary)
Biggs Boiler Works Co.
Manitowoc Eng. Works.
Dryers (Vacuum)
Minton Vacuum Dryer Corp.
Dryer Exhaust
Nash Engineering Co.
Dryer Felts
Appleton Woolen Co.
Fitchburg Duck Mills.
F. C. Huyck & Sons.
Morey Paper Mill Sup. Co.
Shuler & Benninghofen.
Dryer Steam Circulation & Drainage
Farnsworth Co.
Fulton Engineering Co.
Healy-Huff Co.
Stickle Steam Specialties Co.
Dryer Temperature Control
Fulton Engineering Co.
Stickle Steam Specialties Co.
Drying Machines
J. O. Ross Eng. Corp.
John Waldron Corp.
Drying Systems
J. O. Ross Eng. Corp.
John Waldron Corp.
Dusters
The Moore & White Co.
Noble & Wood Mach. Co.
Dust Collecting Systems
Holyoke Mach. Co.
Dyestuffs
General Dyestuff Corp.
Economizers
Foster Wheeler Corp.
J. O. Ross Eng. Corp.
Stickle Steam Specialties Co.
Wheeler Condenser & Eng. Co.
Electrical Machinery
Allis-Chalmers Co.
General Electric Co.
Electric Drives
General Electric Co.
Cutler-Hammer Mfg. Co.
Elevators
The Jeffrey Mfg. Co.
Link-Belt Company.
Elevators (Portable)
The Jeffrey Mfg. Co.
Link-Belt Company.
Embossing Machines
B. F. Perkins & Son, Inc.
John Waldron Corp.
Engines (Steam)
Allis-Chalmers Co.
Lawrence Mach. & Pump Co.
Engineers
Henry Black
James L. Carey.
Hardy S. Ferguson.
Ferguson Engineers.
George F. Hardy.
C. C. Hockley.
Karl A. Lofren.
Arthur D. Little, Inc.
B. T. McBain
Rust Engineering Co.
V. D. Simons.
D. Manson Sutherland, Jr.
H. S. Taylor.
Engineers (Drying)
J. O. Ross Eng. Corp.
Engineers (Heating and Ventilating)
J. O. Ross Eng. Corp.
Engineers (Industrial)
L. V. Estes, Inc.
Evaporators
E. B. Badger & Sons Co.
Swenson Evaporator Co.
The Zaremba Co.
Evaporators (Disc)
E. B. Badger & Sons Co.
Manitowoc Eng. Works.
Swenson Evaporator Co.
Exhausters
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.
Fans
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.
Feed Water Treatment
The Permutit Co.
Felts and Jackets
Albany Felt Co.
Appleton Woolen Co.
Bulkley, Dunton & Co.
Draper Bros. Co.
Fitchburg Duck Mills.
F. C. Huyck & Sons.
Lockport Felt Co.
Shuler and Benninghofen.
Waterbury Felt Co.
Felt and Wire Guides
Moore & White Co.
Felt Cleaning Material
Oakite Products, Inc.
Filter (Continuous Suction)
Oliver Continuous Filter Co.
United Filters Corp.
Filters (Pressure and Gravity)
Hungerford & Terry, Inc.
The Permutit Co.
United Filters Corp.
Fire Brick
Bernitz Furnace Appliance Co.
Floor Plates (Safety)
Joseph T. Ryerson & Son, Inc.
Flour Sack Machinery
Smith & Winchester Mfg. Co.
Flow Meters
Bailey Meter Co.
The Foxboro Co., Inc.
General Electric Co.
Fly Bars
Noble & Wood Mach. Co.
Fly Wheels
Link-Belt Company.
Folding Testers
Foreign Paper Mills, Inc.
Fourdrinier Machines
Bagley & Sewall Co., Inc.
Beloit Iron Works.
The Black-Clawson Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Rice, Barton & Fales, Inc.
Smith & Winchester Mfg.
Fourdrinier Wires
Appleton Wire Works.
Wm. Cabble Excelsior Wire Mfg. Co.
Cheney Bigelow Wire Works.
Eastwood Wire Mfg. Co.
Lindsay Wire Weaving Co.
The W. S. Tyler Co.
Freeness Testers
Foreign Paper Mills, Inc.
Williams Apparatus Co.
Friction Clutches
Carlyle Johnson Mach. Co.
Hill Clutch Mach. & Fdy. Co.
Holyoke Mach. Co.
Link-Belt Company.
Moore and White Co.
T. B. Wood Sons Co.
Furnaces
Combustion Engineering Corp.
Furnace Linings
Alberene Stone Co.
Bernitz Furnace Appliance Co.
Gauges (Pressure)
The Bristol Co.
Gauges (Thickness)
Foreign Paper Mills, Inc.
Gauge Glasses
Jenkins Bros.
Gears
Cleveland Worm & Gear Co.
Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach. Co.
Hill Clutch Mach. & Fdy. Co.
Holyoke Mach. Co.
Horsburgh & Scott Co.
D. O. James Mfg. Co.
The Jeffrey Mfg. Co.
Link-Belt Company.
Gears (Bakelite)
D. O. James Mfg. Co.
Gears (Fibre)
General Electric Co.
D. O. James Mfg. Co.
Gears (Herringbone)
Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach. Co.
Horsburgh & Scott Co.
D. O. James Mfg. Co.
Terry Steam Turbine Co.
Gears (Rawhide)
D. O. James Mfg. Co.
Gears (Silent Chain)
D. O. James Mfg. Co.
Link-Belt Company.
Gears (Worm)
Beloit Iron Works.
Cleveland Worm & Gear Co.
Foote Bros. Gear & Mach. Co.
Holyoke Mach. Co.
D. O. James Mfg. Co.
Link-Belt Company.
Generating Sets
Allis-Chalmers Co.
General Electric Co.
Generators (Steam)
General Electric Co.
Terry Steam Turbine Co.
Generators (Turbo)
Allis-Chalmers Co.
Canadian Westinghouse, Ltd.
General Electric Co.
Terry Steam Turbine Co.
Glues
E. F. Russ Co.
Governors (Pump)
General Electric Co.
Grab Buckets
Link-Belt Company.
Granite Rolls
Beloit Iron Works.
Jones Bros. Co.
B. F. Perkins & Sons Co., Inc.
Grease
Standard Oil Co.
Grease Cups
Link-Belt Company.
The Lunkenheimer Co.
Grinders (Pulp)
Am. Voith Contact Co.
Gibbs-Brower Co.
Glens Falls Mach. Works.
Holyoke Mach. Co.
Grinding Wheels
Norton Co.
Hangers
Hill Clutch Mach. & Fdy. Co.
Link-Belt Company.
S K F Industries, Inc.
T. B. Wood Sons Co.
Hangers (Electric Light)
The Thompson Electric Co.
Heaters (Open Steam)
Biggs Boiler Works.
Heaters (Unit)
J. O. Ross Eng. Corp. Co.
Heaters (United Steam, Fan Blast)
J. O. Ross Eng. Corp.
Heating Systems
J. O. Ross Eng. Corp.
Hoists (Chain)
The Chisholm-Moore Mfg. Co.
Roeper Crane & Hoist Wks., Inc.
Joseph T. Ryerson & Son, Inc.
Hoists (Electric)
The Chisholm-Moore Mfg. Co.
General Electric Co.
Link-Belt Company.
Reading Chain & Block Corp.
Roeper Crane & Hoist Works.
Joseph T. Ryerson & Son, Inc.
Hoists (Head Gate)
Dayton Beater & Hoist Co.
Hoists (Portable, Air and Steam)
Allis-Chalmers Co.
Joseph T. Ryerson & Son, Inc.
Sullivan Mach. Co.
Hoisting and Conveying Systems
The Jeffrey Mfg. Co.
Link-Belt Company.
Hoisting and Monorail Systems
Link-Belt Company.
Hose
The B. F. Goodrich Rubber Co.
Morey Paper Mill Supply Co.
New York Rubber Corp.
Quaker City Rubber Co.
Humidity Testers
Foreign Paper Mills, Inc.
Hydraulic Machinery
Holyoke Mach. Co.
Southwark Fdy. & Mach. Co.
Hygrometers
Foreign Paper Mills, Inc.
Incinerators
The Biggs Boiler Works.
Manitowoc Eng. Works.
Indicators (CO_2, NH_3, SO_2, etc.)
Bailey Meter Co.
The Bristol Co.
The Permutit Co.
Indicators (Speed)
Foreign Paper Mills, Inc.
Iron & Steel Supplies
Joseph T. Ryerson & Son, Inc.
Investment Securities
H. D. Knox & Co.
Jordan Engines
Appleton Machine Co.
Emerson Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Mach. Co.
Port Arthur Shipbuilding Co.
Smith & Winchester Mfg. Co.
Shartle Bros. Mach. Co.
Jordan Fillings
The Mid-West Mach. Co.
Noble & Wood Mach. Co.
The Shartle Bros. Mach. Co.
Kettles (Steam Jacketed)
The Biggs Boiler Wks. Co.
Manitowoc Eng. Works.
Riter-Conley Co.
Knives
Simonds Saw & Steel Co.
Knife Grinders
Chas. Koegel's Sons, Inc.
Knotters (Knot Screen)
Improved Paper Mach. Co.
Rice, Barton & Fales, Inc.
Kraft and Sulphate Pulps
The Borregaard Co., Inc.
Laboratory Machinery
Noble & Wood Mach. Co.
Lace Leather
Graton & Knight Co.
Chas. A. Schieren Co.
Layboys
Gibbs-Brower Co.
Moore and White Co.
Leather Belting Cement
Graton & Knight Co.
Leather Link Belting
Chas. A. Schieren Co.
Leather Packings
Graton & Knight Co.
Chas. A. Schieren Co.
Linings (Furnace)
Bernitz Furnace Appliance Co.
Loft Paper Dryers
John Waldron Corp.
Lubricating Grease
Standard Oil Co.
Lubricators
S. F. Bowser & Co., Inc.
Eastwood Wire Mfg. Co.
The Lunkenheimer Co.
Machine Shop Equipment
Joseph T. Ryerson & Son, Inc.
Magnetic Separators
Dings Magnetic Separator Co.
Measuring Devices
Foreign Paper Mills, Inc.
Mechanical Draft Apparatus
The Jeffrey Mfg. Co.
Mechanical Pulp
J. Anderson & Co.
The Borregaard Co.
Meters (Flow)
Bailey Meter Co.
The Foxboro Co., Inc.
General Electric Co.
Micrometers (Desk and Pocket)
Foreign Paper Mills, Inc.
Micrometer Roll Calipers
Lobdell Car Wheel Co.
Microscopes
Foreign Paper Mills, Inc.
Motor Generator Sets
Allis-Chalmers Co.
General Electric Co.
Motors
Allis-Chalmers Co.
Am. Electric Motor Co.
Canadian Westinghouse, Lt.
General Electric Co.
Reliance Elec. & Eng. Co.
Napkin Folders
Gibbs-Brower Co.
Hudson-Sharp Mach. Co.
Paper Converting Mach. Co.
Oils
Standard Oil Co.
Oil Burning Equipment
Combustion Eng. Corp.
Oil Storage Systems
Biggs Boiler Works Co.
Riter-Conley Co.
Opacity Testers
Foreign Paper Mills, Inc.
Overhead Carrying Systems
The Chisholm-Moore Mfg. Co.
Swenson Evaporator Co.
Packing (Asbestos)
B. F. Goodrich Rub. Co.
Packing (Rubber)
Quaker City Rubber Co.
Paint (Metal Preservative)
The Nitrose Co.
The Vortex Mfg. Co.
Paper Bag Machinery
Gibbs-Brower Co.
Smith & Winchester Mfg. Co.
Paper Cutters & Slitters
Beloit Iron Works.
Cameron Machine Co.
Gibbs-Brower Co.
Hamblet Machine Co.
Samuel M. Langston Co.
The Moore & White Co.
Smith & Winchester Mfg. Co.
Paper Calender Rolls
H. W. Butterworth & Sons Co.
Gibbs-Brower Co.
Holyoke Mach. Co.
John Waldron Corp.
Paper Distributers
Perkins-Goodwin Co.
Paper Machines
Bagley & Sewall Co., Inc.
Beloit Iron Works.
The Black-Clawson Co.
Dominion Eng. Wks., Ltd.
Gibbs-Brower Co.
Rice, Barton & Fales, Inc.
Pusey & Jones Corp.
Smith & Winchester Mfg. Co.
Paper Machine Drives
Beloit Iron Works.
Canadian Westinghouse, Ltd.
Cleveland Worm & Gear Co.
Cutler-Hammer Mfg. Co.
Foote Bros. Gear & Mach. Co.
General Electric Co.
Link-Belt Company.
Paper Manufacturers
Hammermill Paper Co.
Kalamazoo Veg. Parchment Co.
Paper Manufacturers' Supplies
J. Anderson & Co.
The Borregaard Co., Inc.
Diamond Alkali Co.
Gibbs-Brower Co.
The Mathieson Alkali Works.
Penn. Salt Mfg. Co.
Perkins-Goodwin Co.
Paper & Pulp Mill Brokers
Gibbs-Brower Co.
Paper Scales
Foreign Paper Mills, Inc.
Paper Stock Cutters
Taylor, Stiles & Co.
Paper Testing Machinery
Foreign Paper Mills, Inc.
B. F. Perkins & Son, Inc.
Parchment Manufacturers
Kalamazoo Veg. Parchment Co.
Penstocks
The Biggs Boiler Works Co.
Manitowoc Eng. Works.
Rodney Hunt Mach. Co.
Riter-Conley Co.
Perforated Metals
Charles Mundt & Sons.
Perforators
Gibbs-Brower Co.
Pillow Blocks
The Hill Clutch Mach. & Fdry. Co.
Link-Belt Company.
T. B. Wood Sons Co.
Pipe
Crane Co.
Joseph T. Ryerson & Son, Inc.
Pipe Riveted Steel
Abendroth & Root Mfg. Co.
The Biggs Boiler Works.
Riter-Conley Co.
Pipe (Spiral)
Abendroth & Root Mfg. Co.
Naylor Spiral Pipe Co. Inc.
Joseph T. Ryerson & Son.
Piping Equipment
Pittsburgh Piping and Equipment Co.
Pipe Systems Installed
Pittsburgh Piping & Equipment Co.
Platers
B. F. Perkins & Sons, Inc.
Plates (Steel)
Joseph T. Ryerson & Son, Inc.
Pneumatic Tools
Sullivan Mach. Co.
Joseph T. Ryerson & Son, Inc.
Pneumatic Thickeners
Improved Paper Mach. Co.
Power Transmission
Allis-Chalmers Co.
The Carlyle Johnson Machine Co.
Hill Clutch Mach. & Fdy. Co.
Jeffrey Mfg. Co.
Link-Belt Company.
T. B. Wood Sons Co.
Printing Presses
Gibbs-Brower Co.
Printing Machines
Gibbs-Brower Co.
John Waldron Corp.
Pulleys
Hill Clutch Mach. & Fdy. Co.
Holyoke Mach. Co.
Link-Belt Company.
T. B. Wood Sons Co.
Pulp (Chemical)
J. Anderson & Co.
The Borregaard Co., Inc.
Johaneson, Wales & Sparre, Inc.
Lagerloef Trading Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
The Pulp & Paper Trading Co.
Pulp and Paper Mill Machinery
Bagley & Sewall Co., Inc.
The Black-Clawson Co.
Davis, Frank H.
Beloit Iron Works.
The Biggs Boiler Works Co.
Gibbs-Brower Co.
Glens Falls Mach. Works.
William Hamilton Ltd.
Holyoke Mach. Co.
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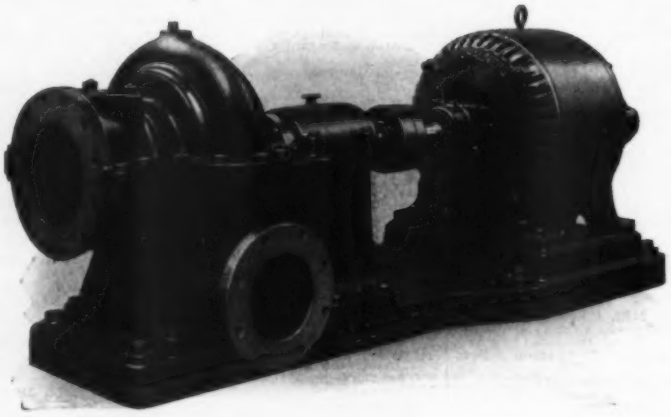

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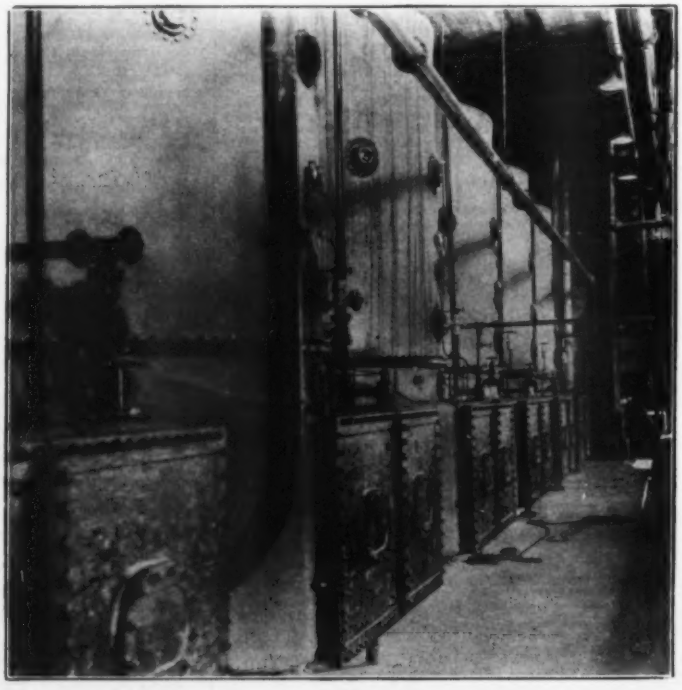

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Southwark Fdy. & Mach. Co.

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Glens Falls Mach. Wks
Holyoke Mach. Co.

Pulp Refiners (Howard)
Manitowoc Eng. Works

Pulp Stones
Norton Co.

Pulp Testers
Foreign Paper Mills, Inc.
Williams Apparatus Co.

Pulp Thickeners
The Moore & White Co.
Oliver Continuous Filter Co.
United Filters Corp.

Pulp Washers
Oliver Continuous Filter Co.
United Filters Corp.

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The Jeffrey Mfg. Co.
Link-Belt Company.

Pulverized Fuel Equipment
Combustion Eng. Corp.

Pumping Machinery
Am. Steam Pump Co.
Lawrence Mach. & Pump Co.

Pumping Systems (Air Lift)
Am. Steam Pump Co.

Pumps (Boiler Feed)
Am. Steam Pump Co.
Buffalo Steam Pump Co.
De Laval Steam Turbine Co.
Gibbs-Brower Co.

Pumps (Centrifugal)
Allis-Chalmers Mfg. Co.
Am. Steam Pump Co.
Buffalo Steam Pump Co.
Gibbs-Brower Co.
Glens Falls Machine Wks.
Kingsford Fdy & Mach. Wks.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
The Moore & White Co.
Scranton Pump Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.

Pumps (Condensate)
W. B. Connor Co., Inc.
Farnsworth Co.

Pumps (Deep Well)
American Steam Pump Co.
Hudson-Sharp Mach. Co.

Pumps (Receiver)
Stebbins Eng. & Mfg. Co.

Pumps (Stock)
Allis-Chalmers Mfg. Co.
Am. Steam Pump Co.
Beloit Iron Works.
Buffalo Steam Pump Co.
Downingtown Mfg. Co.
Gibbs-Brower Co.
Glens Falls Mach. Wks.
Kingsford Fdy & Mach. Wks.
The Moore & White Co.
Noble & Wood Mach. Co.
Paper & Textile Mach. Co.
The Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.

Pumps, Turbine
American Steam Pump Co.

Pumps (Vacuum)
American Steam Pump Co.
Gibbs-Brower Co.
Nash Eng. Co.
Oliver Continuous Filter Co.
Paper & Textile Mach. Co.
Scranton Pump Co.
Sullivan Machinery Co.

Pyrometers
The Bristol Co.

Rag Cutters
Gibbs-Brower Co.
B. F. Perkins & Son, Inc.
Taylor, Stiles & Co.

Rag and Paper Dusters
Gibbs-Brower Co.
Holyoke Mach. Co.

Reclaiming Machinery
Improved Paper Mach. Co.
Swenson Evaporator Co.
The Zaremba Co.

Recorders (CO_2, NH_3, SO_2, etc.)
The Bristol Co.
The Permutit Co.

Recording Instruments (Temperature, Pressure, Humidity, Flow.)
The Bristol Co.
The Foxboro Co., Inc.
Co.

Reduction Gears
Cleveland Worm & Gear Co.
Farrel-Birmingham Co., Inc.
Foote Bros. Gear & Mach.
Hill Clutch Mach. & Fdy. Co.
Horsburgh & Scott Co.
Terry Steam Turbine Co.

Reels
Beloit Iron Works.
Gibbs-Brower Co.
The Moore & White Co.
Smith & Winchester Mfg. Co.

Reels (Automatic Collapsing)
Gibbs-Brower Co.
Hudson-Sharp Mach. Co.

Refiners
Emerson Mfg. Co.
Hermann Mfg. Co.
Improved Paper Mach. Co.

Refractories
Bernitz Furnace Appliance Co.

Regulators (Grinder Pressure)
General Electric Co.

Regulators (Grinder, Speed and Load)
General Electric Co.

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Mine & Smelter Supply Co.

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Beloit Iron Works.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Gibbs-Brower Co.
Holyoke Mach. Co.
Lobdell Car Wheel Co.
Paper & Textile Mach. Co.
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John Waldron Corp.

Rolls (Embossing)
John Waldron Corp.

Rolls (Rubber Covered)
Beloit Iron Works.
Cincinnati Rubber Mfg. Co.
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Rolls (Wood)
Rodney Hunt Mach. Co.

Roll Grinding Machines
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Lobdell Car Wheel Co.
Chas. Walmsley & Co., Ltd.

Roof Drying Systems
J. O. Ross Eng. Corp.

Rope Drives
Hill Clutch Mach. & Fdy. Co.
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Vera Chem. Co., No. Milwaukee, Wis.
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Vera Chem. Corp., Stoneham, Mass.
Western Paper Makers Chem. Co.

Rosin Melters
Manitowoc Engineering Works.

Rotaries
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Manitowoc Eng. Works.
Riter-Conley Co.

Rotary Bleaching Boilers
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Manitowoc Eng. Works.

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Kalbfleisch Corp.

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Gibbs-Brower Co.
Glens Falls Mach. Works.
Improved Paper Mach. Co.
The Moore & White Co.
Oliver Continuous Filter Co.
United Filters Corp.

Saws
Allis-Chalmers Co.
Simonds Saw & Steel Co.

Scales (Desk and Pocket)
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Downingtown Mfg. Co.
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Screens (Centrifugal)
Improved Paper Mach. Co.
Rice, Barton & Fales, Inc.

Screens (Perforated Metal)
Charles Mundt & Sons.

Screens (Rotary)
The Moore & White Co.

Screens (Woven Wire)
The W. S. Tyler Co.

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The B. F. Goodrich Rubber co.

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William A. Hardy & Sons.
Union Screen Plate Co.

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Gibbs-Brower Co.

Sedimentation Testers
Foreign Paper Mills, Inc.

Shafting
Allis-Chalmers Co.
Hill Clutch Mach. & Fdy. Co.
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Joseph T. Ryerson & Son, Inc.
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Sheets (Iron and Steel)
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Shovels (Gas)
Link-Belt Co.

Shower Pipes
Beloit Iron Works.
F. W. Roberts Mfg. Co.
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Gibbs-Brower Co.
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The Jeffrey Mfg. Co.
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Kalbfleisch Corp., The

Sizing, Testers
Foreign Paper Mills, Inc.

Slitters
Gibbs-Brower Co.
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The Biggs Boiler Works Co.
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Riter-Conley Co.

Stock Inlets
Valley Iron Works Co.

Stokers
American Eng. Co.
Combustion Eng. Corp.
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The Biggs Boiler Works Co.
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Gibbs-Brower Co.
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Improved Paper Mach. Co.

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Manitowoc Eng. Works.
Riter-Conley Co.

Tanks (Oil)
Biggs Boiler Works Co.
The Lunkenheimer Co.
Riter-Conley Co.

Tanks (Paint)
Biggs Boiler Works Co.
Riter-Conley Co.

Tanks (Jacketed)
Biggs Boiler Works Co.
Manitowoc Eng. Works.

Tanks (Steel Welded)
Riter-Conley Co.

Tanks (Wood)
Hauser-Stander Tank Co.
Kalamazoo Tank & Silo Co.
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Tank Lining (Rubber)
The B. F. Goodrich Rubber Co.

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Hudson-Sharp Mach. Co.

Towel (Interfolding Mach.)
Hudson-Sharp Mach. Co.
Paper Converting Mach. Co.

Towers (Acid)
A. T. Stearns Lumber Co.

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The Chisholm-Moore Mfg. Co.
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Canadian Westinghouse, Ltd.
De Laval Steam Turbine Co.
General Electric Co.
Terry Steam Turbine Co.

Unions
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Eastwood Wire Mfg. Co
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Used Paper and Pulp Mill Machinery
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Gibbs-Brower Co.

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Crane Co.
G. M. Davis Regulator Co.
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Lunkenheimer Co., The
The Wm. Powell Co.

Valves (Angle)
Eastwood Wire Mfg. Co.

Valves (Digester)
Eastwood Wire Mfg. Co.
Rice, Barton & Fales, Inc.

Valves (Electrically Operated)
Cutler-Hammer Mfg. Co.
General Electric Co.
The Lunkenheimer Co.

Valves (Gate)
The Lunkenheimer Co.

Valves (Non-return; Emergency Stop)
The Lunkenheimer Co.

Valves (Quick Opening)
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Green Bay Barker Mach. & Tool Works.
The Lunkenheimer Co.
The Shartle Bros. Mach. Co.

Valves (Relief)
The Lunkenheimer Co.

Valves (Stock)
Eastwood Wire Mfg. Co.
Green Bay Barker Mach. & Tool Works.

Valve Balls and Discs
B. F. Goodrich Rubber Co.

Valve Specialties
Eastwood Wire Mfg. Co.
The Lunkenheimer Co.

Vapor Absorption Systems
J. O. Ross Eng. Corp.

Vats (Steel)
The Biggs Boiler Works Co.

Ventilating Systems
The Jeffrey Mfg. Co.
J. O. Ross Eng. Corp.

Voltmeters
The Bristol Co.

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Biggs Boiler Works Co.

Washer Wires
Eastwood Wire Mfg. Co.
The W. S. Tyler Co.

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Manitowoc Eng. Works.

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Foster Wheeler Corp.
Wheeler Condenser Eng. Co.

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Gibbs-Brower Co.
Glens Falls Machine Co.
Hungerford & Terry, Inc.
The Permutit Co.

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The Permutit Co.

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Allis-Chalmers Co.
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Downingtown Mfg. Co.
Gibbs-Brower Co.
Glens Falls Machine Wks.
Rice, Barton & Fales, Inc.
Smith & Winchester Mfg. Co.

Whistles
The Lunkenheimer Co.

Wire Signs
Cheney Bigelow Wire Works.

Wire, Steel (Plain or Coated)
Joseph T. Ryerson & Son, Inc.

Wire Tying Machines
The Gerrard Co., Inc.

Wood Grapples
Link-Belt Co.

Wood Pipe
The Michigan Pipe Co.
A. W. Wyckoff & Son Co.

Worm Drives
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Link-Belt Co.

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Alphabetical Index to Our Advertisers

When writing them, please mention The Paper Industry

Abendroth & Root Mfg. Co.....2006
Albany Felt Co. 2076
Alberene Stone Co. 1970
Allis Chalmers Co. 2218
American Electric Motor Co.....1991
American Engineering Co. ...1976, 1977
American Hoist & Derrick Co. 2169
American Steam Pump Co.....2173
American Telephone & Telegraph Co.
American Voith Contact Co. 2008
Anderson & Co., J. 2204
Andrews-Bradshaw Co. 1972
Appleton Machine Co. 2011
Appleton Wire Works 2030
Appleton Woolen Mills 2002
A. P. W. Paper Co. 2162

Badger & Sons Co., E. B.....2029
Bagley & Sewall Co., Inc.....2074
Bailey Meter Co., The .....
Bedford Pulp & Paper Co.....2194
Beloit Iron Works 1967
Bemis Associates, Inc. 2207
Bernitz Furnace Appliance Co.....2000
Bigelow Wire Works, Cheney.....2210
Biggs Boiler Works Co., The.....2214
Black-Clawson Co., The 2004
Black, Henry 2184
Bolton & Sons, Inc., John W.....22f2
Borregaard Co., Inc., The 2204
Bowser Co., Inc., S. F.....2013
Bristol Co., The 2171
Brown Paper Co., L. L.....2108
Bryant Paper Co. 2112
Buffalo Steam Pump Co. 2156
Bulkley, Dunton & Co. 2211
Butterworth & Sons Co., H. W.....2183

Cabble Excelsior Wire Mfg. Co., The Wm. 1989
Cameron Machine Co. 1988
Canadian Westinghouse Co. 2134
Carey, James L. 2184
Carlyle Johnson Mach. Co., The ...2144
Cheney Bigelow Wire Works.....2210
Chicago Belting Co. 2038
Chisholm-Moore Mfg. Co., The.....1987
Cincinnati Rubber Mfg. Co.....2155
Cleveland Worm & Gear Co., The...2016
Coe Mfg. Co., The....Inside Front Cover
Combustion Engineering Corp. 1971
Connor Co., Inc., W. B.....2029
Corn Products Refining Co. 2211
Crane Co. .....
Crescent Belt Fastener Co. .....
Cutler-Hammer Mfg. Co..1997, 2027, 2147

Davis Co., Frank H. 2182
Davis Regulator Co., G. M.....2185
Dayton Beater & Hoist Co.....2145
DeLaval Steam Turbine Co.....2037
Detroit Sulphite Pulp & Paper Co...2167
Diamond Alkali Co. 2200
Dilts Machine Works, Inc.....2034
Dings Magnetic Separator Co.....2010
Dominion Engineering Works, Ltd...2128
Downington Mfg. Co...Inside Back Cover
Draper Bros. Co. 2208

Eastwood Wire Manufacturing Co...2036
Edgar Brothers Company 1985
Edge Moor Iron Co. 2001
Electro Bleaching Gas. Co.....1982
Elixman Paper Core Co. 2207
Emerson Mfg. Co. 2020
Estes, Inc., L. V. 2170

Farnsworth Co. 2130
Farrel-Birmingham Co., Inc. 2146
Ferguson Engineers 2184
Ferguson, Hardy S. 2158
Fitchburg Duck Mills 2209
Foote Bros. Gear & Mach. Co.....1995
Foreign Paper Mills, Inc.....2186
Foster Wheeler Corp. 1994
Foxboro Co., Inc., The.....2143
Fulton Engineering Co., The.....1996

General Dyestuffs Corp. 2199
General Electric Co. 1992, 1993
Gerrard Co., Inc., The 2033
Gibbs-Brower Co. 2066, 2182
Glen Falls Machine Works.....2160
Goodrich Rubber Co., B. F.....2021
Graton & Knight Co. .....Front Cover
Green Bay Barker Mach. and Tool Works 2149

Hamblet Machine Co. 2213
Hamilton, Ltd., William 2126
Hammermill Paper Co. 2140
Hardy, George F. 2150
Hardy & Sons, Wm. A.....2212
Hauser-Stander Tank Co., The.....2163
Healy-Ruff Co. 2037
Heine Boiler Co. 1971
Hercules Powder Co. .....
Hermann Mfg. Co. 2206
Hill Clutch Mach. & Foundry Co....2164
Hockley, C. C. 2184
Holyoke Mach. Co. 2174
Horsburgh & Scott Co., The.....2100
Hudson-Sharp Machine Co.....2213
Hungerford & Terry, Inc.....2202
Hunt Machine Co., Rodney.....2164
Huyck & Sons, F. C. 2031
Hyatt Roller Bearing Co. 2104

Improved Paper Machinery Co.....2024
Inglis Co., Ltd., John 2136
International Combustion Eng. Corp. 1971

James Mfg. Co., D. O.....1999
Jeffrey Mfg. Co., The 2009
Jenkins Bros. 2185
Jenssen Co., G. D. 2172
Johaneson, Wales & Sparre, Inc.....2062
Jones & Sons Co., E. D.....2176
Jones Foundry & Machine Co., W. A 2166
Jones Bros. Co. 2208

Kalamazoo Tank & Silo Co.....2025
Kalamazoo Vegetable Parchment Co. 2202
Kalbfleisch Corporation, The 2106
Kingsford Foundry & Machine Wks. 2098
Knox & Co., H. D. 2202
Knox Woolen Co. 2070

Ladd Water Tube Boiler Co. 1971
Lagerloef Trading Co., Inc.....2064
Langston Co., Samuel M. 2032
Lawrence Mach. & Pump Co.....2151
Lawrence Pump & Engine Co.....2183
Lefren, Karl A. 2170
Lewellen Mfg. Co. 2154
Lindsay Wire Weaving Co., The....2216
Link-Belt Co. 2220
Little, Inc., Arthur D. 2184
Lobdell Car Wheel Co. 2100
Lockport Felt Co. 2216
Lunkenheimer Co., The 2165

Manitowoc Engineering Works ....
Marathon Paper Mills Co.....2072
Mathieson Alkali Works, Inc.....1969
McBain, B. T. 2184
Merrimac Chemical Co. 2158
Michigan Pipe Co. 2192
Mine & Smelter Supply Co.....2188
Minton Vacuum Dryer Corp...1980, 1981
Mitts & Merrill 2206
Moore & White Co. 2110
Morey Paper Mill Supply Co.....2210
Mosinee Paper Mills Co.....2082
Morse Chain Co. 2005
Mundt & Sons, Charles.....2212

Nash Engineering Co., The.....2164
National Safety Council 2222
Naylor Spiral Pipe Co.....1975
Nekoosa-Edwards Paper Co.....2090
New York Rubber Corp. 2170
Nitrose Co., The 2007
Norton Co. 2168
Noble & Wood Mach. Co.....2088
Norwood Engineering Co. 2014

Oakite Products, Inc. 2178
Oliver Continuous Filter Co.....1974

Paper Converting Machine Co.....2175
Paper Makers Chemical Co.....2198
Paper & Textile Machinery Co.....2084
Pennsylvania Salt Mfg. Co.....2200
Perkins & Son Co., Inc., B. F.....2026
Perkins-Goodwin Co. 1990
Permutit Co., The 2023
Philadelphia Quartz Co. 2201
Pickles, W. F. 2212
Pittsburgh Piping & Equipment Co..2170
Port Arthur Shipbuilding Co.....2120
Powell Co., The Wm. 2183
Price & Pierce 2068
Pulp Bleaching Corp. 2078
Pulp & Paper Trading Co.....2204
Pusey & Jones Corp. 1979

Quaker City Rubber Co. 2164

Reading Chain & Block Corp.....2201
Reeves Pulley Co. 2161
Reliance Electric & Engineering Co. 1998
Rhoads & Sons, J. E. 2181
Rhinelander Paper Co. 2116
Rice, Barton & Fales, Inc.....2003
Riter-Conley Co. 2170
Roberts Mfg. Co., F. W.....2199
Roeper Crane & Hoist Works, Inc...2181
Rollway Bearing Co., Inc.....1978
Ross Engineering Corp., J. O.....2118
Russ Company, E. F. 2207
Rust Engineering Co. 2184
Ruths Accumulator Co. 2094
Ryerson & Sons, Joseph T.....2151
Ryther & Pringle Co., The.....2138

Sandy Hill Iron & Brass Works...2222
Schieren Co., Chas. A.....Back Cover
Scranton Pump Co. 2212
Seaman Paper Co. 2114
Shuler & Benninghofen 2028, 2182
Simonds Saw & Steel Co.....2175
Simons, V. D. 2184
S. K. F. Industries 2017
Smidth & Co., F. L. 2035
Smith Co., S. Morgan 2148
Smith & Winchester Mfg. Co.....2178
Solvay Sales Corp. 2196
Southwark Foundry & Machine Co..2204
St. Regis Paper Co.....2142
Standard Oil Co. 2012
Stearns Lumber Co., A. T.....2159
Stebbins Eng. & Mfg. Co.....2122
Stephenson Mfg. Co. 2158
Stickle Steam Specialties Co.....2022
Stowe & Woodward Co. 2210
Sullivan Machinery Co. 2092
Sutherland, D. Manson, Jr. 2184
Swenson Evaporator Co. 2152

Taylor, H. S. 2184
Taylor, Stiles & Co. 2086
Terry Steam Turbine Co., The.....1973
Texas Gulf Sulphur Co.....2080
Thompson Electric Co., The 2150
Tileston & Hollingsworth Co. 2194
Timken Roller Bearing Co., The....2017
Tyler Company, The W. S. 2177

Union Bag & Paper Corp.....2096
Union Screen Plate Co. 2212
United Filters Corp. 2132

Valley Iron Works Co. 2015
Virginia Smelting Co. 2201
Vortex Mfg. Co., The.....2019

Waldron Corp., John 2157
Walmsley & Co., Ltd., Chas.....2124
Warren Steam Pump Co., Inc.....2153
Waterbury Felt Co. 2180
Whiting Corp. 1878
Williams Apparatus Co. 2190
Williams & Sons, I. B.....2102
Woods Sons Co., T. B.....2214
Wyckoff & Sons Co., A. 2209

Zaremba Co. 2218

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